AOSIS

Self-Directed Learning in the era of the COVID-19 pandemic

Research on the affordances of online virtual excursions

EDITED BY

Josef de Beer, Neal Petersen, Elsa Mentz & Robert J. Balfour

Self-Directed Learning in the era of the COVID-19 pandemic

Research on the affordances of online virtual excursions

Self-Directed Learning in the era of the COVID-19 pandemic

Research on the affordances of online virtual excursions

EDITED BY
Josef de Beer, Neal Petersen,
Elsa Mentz & Robert J. Balfour

AOSIS

Peer review declaration

The publisher (AOSIS) endorses the South African 'National Scholarly Book Publishers Forum Best Practice for Peer Review of Scholarly Books'. The manuscript underwent an evaluation to compare the level of originality with other published works and was subjected to rigorous two-step peer review before publication, with the identities of the reviewers not revealed to the editor(s) or author(s). The reviewers were independent of the publisher, editor(s) and author(s). The publisher shared feedback on the similarity report and the reviewers' inputs with the manuscript's editor(s) or author(s) to improve the manuscript. Where the reviewers recommended revision and improvements the editor(s) or author(s) responded adequately to such recommendations. The reviewers commented positively on the scholarly merits of the manuscript and recommended that the book be published.

Research justification

This book is Volume 9 in a North-West University (NWU) book series on self-directed learning in various contexts and the result of a University Capacity Development Grant (UCDG) by the Department of Higher Education and Training. It disseminates original research on the affordances of virtual online excursions for first-year university (NWU) students to enhance self-directed learning as well as their academic integration into the higher education institution. Whereas the NWU has been engaging in research on face-to-face student excursions since 2016, the COVID-19 pandemic necessitated rethinking the excursions and adapting approaches for an online environment. Eleven of the thirteen chapters in the book report empirical data, with the exception of two chapters that can be categorised as systematic reviews. This design-based, mixed methods research focuses on how virtual online excursions could enhance self-directed learning in first-year students in the faculties of Education, Law and Health Sciences at the NWU. The online virtual excursions utilised problem-based, cooperative learning principles, and students engaged with ill-structured problems in contexts relevant to their selected professions. Quantitative data include an analysis of student responses to the self-directed learning instrument of Cheng et al. (2010) and online opinion polls. Qualitative data were collected through open-ended questionnaires, focus group interviews, and an analysis of artefacts (e.g. students' e-posters). In some of the chapters, Cultural-Historical Activity Theory is used as a research lens to provide a 'thick description' of the findings. Findings show a statistically significant difference in terms of self-directed learning after student engagement in the virtual online excursions.

The book is devoted to scholarship in the field of preservice teacher education, with a specific focus on research into the enhancement of self-directed learning, and contributes to the discourse on creating a disposition towards self-directed learning during the social and academic integration of first-year students within higher education institutions. Two chapters also deal with research on the development of self-directed learning and nuanced understandings of their chosen professions in Law and Health Sciences students. The target audience is scholars working in the fields of teacher education, self-directed learning, engaging pedagogies, problem-based learning, cooperative learning, and gamification. Whereas social constructivist learning theory served as an overarching theoretical framework for the virtual excursions, the various chapters in the book also draw on other secondary theories, for example self-determination theory, social interdependence theory, gender theory, and the 'withitness' model of Kounin (1970).

In accordance with the requirements of the Department of Higher Education and Training, this book contains more than 50% original unpublished content, and no part of the work was plagiarised. Ethical clearance for the project was provided by the NWU's Faculty of Education Research Ethics Committee and from the NWU Registrar as a gatekeeper, and all ethical guidelines were followed during the research.

Josef de Beer, Research Unit Self-Directed Learning, Faculty of Education, North-West University, Potchefstroom, South Africa

Neal Petersen, Research Unit Self-Directed Learning, Faculty of Education, North-West University, Potchefstroom, South Africa

Elsa Mentz, Research Unit Self-Directed Learning, Faculty of Education, North-West University, Potchefstroom, South Africa

Robert J. Balfour, Office of the Deputy Vice-Chancellor, Teaching and Learning, North-West University, Potchefstroom, South Africa

Contents

Chapter 1: Cresting the wave: COVID-19's impact on reconceptualising higher education professional development   **1**

Robert J. Balfour

Chapter 2: Rhizomic development of the student excursion, across three faculties in a multi-campus university   **17**

Yolani Geldenhuys & Josef de Beer

Contents

Chapter 4: Developing capacity on several levels: Scaffolding learning, leadership development, and service-learning   **55**

Elize Küng, Lloyd Conley & Lounell White

Chapter 5: First-year students' conceptions of the complexity of the profession, sense of belonging, and self-directed learning   **77**

Neal Petersen, Elsa Mentz & Josef de Beer

Chapter 6: Exploring virtual excursions for self-directed learning: A systematic literature review   **101**

Jako Olivier & Nothile A.T. Kunene

Chapter 8: Students' experiences of cooperative learning in a virtual excursion   149

Anitia Lubbe & Neal Petersen

**Chapter 9: Gamification and addressing social justice and
inclusivity through the 'Famine and Abundance' game   171**

Byron J. Bunt, Josef de Beer & Neal Petersen

Abbreviations, figures and tables appearing in the text and notes

List of abbreviations

AR	Augmented Reality
ARB	Advisory Regulatory Board
CDE	Centre for Development and Enterprise
CHAT	Cultural-Historical Activity Theory
CHE	Christian Higher Education
CL	Cooperative Learning
CPBL	Cooperative Problem-Based Learning
CVI	Core Value Index
DBR	Design-Based Research
DHET	Department of Higher Education and Training
FYE	First-Year Experience
HEI	Higher Education Institution
IC	Interpersonal Communication
ICT	Information and Communications Technology
ITE	Initial Teacher Education
LLB	*Baccalareus Legum*
LM	Learning Motivation
LMS	Learning Management System
LSSA	Law Society of South Africa
MOOC	Massive Open Online Learning Courses
MRTEQ	Minimum Requirements for Teacher Education Qualifications
NRF	National Research Foundation
NWU	North-West University
ODL	Open and Distance Learning
PBL	Problem-based Learning
PBOL	Project-based Online Learning
PDF	Portable Document Format
PI	Planning and Implementing
PPC	Person-Process-Context
SDL	Self-Directed Learning
SDLI	Self-Directed Learning Instrument

SDMA   Self-Directed Multimodal Assessment
SDML   Self-Directed Multimodal Learning
SDT   Self-Determination Theory
SM   Self-Monitoring
SPBL   Student-centred Problem-based Learning
UCDG   University Capacity Development Grant
UJ   University of Johannesburg
VLE   Virtual Learning Environments
VR   Virtual Reality
WIL   Work-Integrated Learning
ZPD   Zone of Proximal Development

List of Figures

List of Tables

Notes on Contributors

Robert J. Balfour
Office of the Deputy Vice-Chancellor,
Teaching and Learning, North-West University,
Potchefstroom, South Africa
Email: robert.balfour@nwu.ac.za
ORCID: https://orcid.org/0000-0001-9119-6886

Robert J. Balfour completed his doctoral degree in English language acquisition in Education at Corpus Christi College in Cambridge in 2000 before moving to English Studies at the University of Natal, where he taught English Literature and Language as well as Creative Writing. He then joined the Faculty of Education, where he developed as a specialist in language policy and planning for higher education. His edited book on literary-cultural studies, *Culture Capital and Representation* (with Palgrave, 2010), was received with critical acclaim. In 2015, the book *Education in a new South Africa: Crisis and change* was published by CUP. Balfour has featured in the popular press for perspectives on multilingualism and education. In 2011, he was appointed as professor and dean of the Faculty of Education Sciences on the Potchefstroom campus of NWU before being appointed as deputy vice-chancellor (Teaching and Learning) at NWU in 2017. He is also an honorary professor in the School of Education at the University of KwaZulu-Natal.

Sanette (J.S.) Brits
Hypertension in Africa Research Team, School of Physiology, Nutrition and Consumer Sciences,
Faculty of Health Sciences, North-West University,
Potchefstroom, South Africa
Email: 10069917@nwu.ac.za
ORCID: https://orcid.org/0000-0002-8675-1547

Sanette Brits is an associate professor in the School of Physiology, Nutrition and Consumer Sciences at North-West University's Faculty of Health Sciences. Brits is passionate about creative classroom environments and community outreach projects to enhance education and health. Effective science communication through different teaching approaches can create opportunities for active participation and cooperative learning. Brits has contributed 23 articles ranging from cardiovascular reactivity to creative pedagogy in science education. In October 2021, she had the opportunity to participate in a virtual interprofessional education event, where healthcare professional students from more than 10 countries participated in a collaborative case study analysis. She hopes to continue contributing to and developing interprofessional health education activities for students from the Faculty of Health Sciences, NWU.

Byron J. Bunt

Research Unit Self-Directed Learning,
Faculty of Education, North-West University,
Vanderbijlpark, South Africa
Email: byron.bunt@nwu.ac.za
ORCID: https://orcid.org/0000-0002-2102-4381

Byron J. Bunt is a senior lecturer in the Faculty of Education of the North-West University and is part of the Research Unit Self-Directed Learning. He has been working in the field of teacher education for the past 10 years, and his research niche encompasses cognitive education with a specific focus on developing student creativity and critical thinking through various teaching strategies and technology. Bunt has published in the fields of history education and teacher education. He is the author of five book chapters published by AOSIS and Van Schaik Publishers. He has completed a scholarship for a teaching and learning project involving the use of a self-developed trading card game called 'Dogs of War', which was used within his history classroom to develop his students' self-directed learning abilities. Before lecturing, Bunt worked as a teacher at General Smuts High School in Vereeniging, teaching Social Science and Technology.

Lloyd Conley

Office of the Executive Dean, Educational Leadership,
Faculty of Education, North-West University,
Potchefstroom, South Africa
Email: lloyd.conley@nwu.ac.za
ORCID: https://orcid.org/0000-0002-1470-0433

Lloyd Conley is the executive dean in the Faculty of Education, North-West University. His main research focus is on educational leadership. Conley has headed the Centre of Education Leadership Development and Support, where he worked closely with the Harvard Graduate School of Education. He has published at national and international levels and is a supervisor for postgraduate students.

Ninette Crous

Manager of Student Affairs,
Faculty of Law, North-West University,
Potchefstroom, South Africa
Email: ninette.crous@nwu.ac.za
ORCID: https://orcid.org/0000-0001-6476-6708

Ninette Crous is the Law Faculty's student support and performance manager at NWU. She obtained her BCom Law and LLB degrees *cum laude* at UJ and her LLM at the NWU. Crous is currently registered for her LLD. Her research interests include estate law, focusing on electronic wills, private international law, and civil procedure. She has delivered papers at national and international conferences. Crous is the first person to be appointed in her position and is

establishing, *inter alia*, an intervention programme for law students with the relevant institutional structures to ensure that the students complete their degrees timeously. She is further interested in programmes and projects that focus on the professional development of the students.

Josef de Beer
Research Unit Self-Directed Learning,
Faculty of Education, North-West University,
Potchefstroom, South Africa
Email: josef.debeer@nwu.ac.za
ORCID: https://orcid.org/0000-0002-2411-6599

Josef de Beer is a research professor in the Research Unit Self-Directed Learning, Faculty of Education, NWU. His main research focus is on the affordances of indigenous knowledge to enhance self-directed learning in the natural sciences. However, he also has a keen interest in pre-service teacher education and initiated the first-year student excursion while employed at the University of Johannesburg in 2007. De Beer's accolades include the Higher Education Learning and Teaching Association of South Africa (HELTASA) National Award for Teaching Excellence in 2009, the USA-based National Association of Biology Teachers Award for Research Excellence in 2012, the National Research Foundation's 'Excellence in Science Engagement' Award in 2019, and the Education Association of South Africa's Medal of Honour in 2020. De Beer has published extensively on national and international levels and acts as a supervisor for postgraduate students. He has successfully supervised 40 MEd and PhD students to graduation.

Adri du Toit
Research Unit Self-Directed Learning,
Faculty of Education, North-West University,
Potchefstroom, South Africa
Email: dutoit.adri@nwu.ac.za
ORCID: https://orcid.org/0000-0002-3354-6830

Adri du Toit is a senior lecturer in the Research Unit Self-Directed Learning at the North-West University's Faculty of Education. Her research pertains to teacher preparation with links to curriculum issues and pedagogy and a particular focus on the development of entrepreneurship education. Dr Du Toit has published widely on these issues and was invited to chair five national investigations funded by Umalusi, the South African curriculum overseer. She serves as the president of the South African Association of Family Ecology Consumer Science, supporting the development and expansion of education in this field. Du Toit enjoys collaborating with researchers from across the globe, particularly with academics who share the challenges and delights of developing education on the African continent.

Yolani Geldenhuys
Centre for Teaching and Learning, North-West University,
Potchefstroom, South Africa
Email: yolani.geldenhuys@nwu.ac.za
ORCID: https://orcid.org/0000-0002-4281-8762

Yolani Geldenhuys is a senior academic developer at the Centre for Teaching and Learning at the North-West University, Potchefstroom campus. She completed her MBA in 2005 and obtained a postgraduate diploma in Higher Education in 2016. Her interest and research focus is on the effectiveness of systems and processes in higher education teaching and learning to enhance student success.

Susanna M. Hanekom
Centre for Health Professions Education,
Faculty of Health Sciences, North-West University,
Potchefstroom, South Africa
Email: grieta.hanekom@nwu.ac.za
ORCID: https://orcid.org/0000-0001-7874-7807

Susanna M. Hanekom is the deputy dean for Teaching and Learning in the Faculty of Health Sciences, working in collaboration with the Centre for Health Professions Education. Her main research focus is on developing games (or material) for learning and enriching the teaching environment as a fun way of transferring knowledge and skills. Because of her previous engagement in games for learning (previously called 'serious games'), the first-year excursion was an opportunity to participate in the fun of teaching students about professional development and professional identity. Hanekom has an extensive background in teaching management principles in the nutrition environment to a diverse group of students, working with interprofessional groups and colleagues for a very long time, doing research as part of interprofessional teams, and publishing in these domains for several years. Her later publications mostly follow the theme of education in her subject field, namely nutrition. She supervised 330 master's and doctoral students during her career.

Marietjie Havenga
Research Unit Self-Directed Learning,
Faculty of Education, North-West University,
Potchefstroom, South Africa
Email: marietjie.havenga@nwu.ac.za
ORCID: https://orcid.org/0000-0003-1638-9834

Marietjie Havenga is a professor in the Research Unit Self-Directed Learning, Faculty of Education, North-West University. Her research interests include problem-based and project-organised learning to enhance students' self-directed learning, specifically in computer science education, engineering education, and educational robotics. Marietjie Havenga is a National Research

Foundation (NRF) rated researcher and has received an NRF project grant. She has published in national and international journals, conference proceedings, and chapters in research books. She is involved as a lecturer at the undergraduate level as well as a supervisor of postgraduate students.

Anette Hay
Focus Area Community-based Educational Research,
Environmental Education for Sustainable Development in Communities,
Faculty of Education, North-West University,
Potchefstroom, South Africa;
School of Mathematics, Natural Sciences and Technology Education,
Faculty of Education, North-West University,
Potchefstroom, South Africa
Email: anette.hay@nwu.ac.za
ORCID: https://orcid.org/0000-0002-2210-7218

Anette Hay is a senior lecturer in the subject group Geography and Environmental Education in the School of Mathematics, Natural Sciences and Technology Education at the Faculty of Education (North-West University, Potchefstroom campus) in South Africa. She is interested in environmental education and sustainable development and focuses on implementing different teaching and learning strategies and indigenous knowledge systems in Geography. Hay has published on national and international levels and acts as a supervisor for postgraduate students.

Yolande Heymans
Centre for Health Professions Education,
Faculty of Health Sciences, North-West University,
Potchefstroom, South Africa
Email: yolande.heymans@nwu.ac.za
ORCID: https://orcid.org/0000-0003-4459-2266

Yolande Heymans is a senior lecturer in the Centre for Health Professions Education, Faculty of Health Sciences at NWU. Her main research focus is on health professions education in the higher education context, specifically referring to the scholarship of teaching and learning, enhancing student engagement, and interprofessional collaborative learning. She also has a keen interest in large-class teaching and online learning. Heymans' accolades include the National Teachers Awards for Excellence in Secondary Teaching (2010), the HB and MJ Thom Award for contribution to Education (2011), the Foundation for Advancement of International Medical Education and Research (FAIMER) fellowship (2019–2020), and the Open Educational Research Fellowship (2021–2022). Heymans is a supervisor for postgraduate students in the field of health professions Education. Her recent publications include a book chapter titled: 'The potential of Scholarship of Teaching and Learning research towards transformative pedagogies in higher education: An approach to ethical mindedness'.

Rhea Koch

Centre for Teaching and Learning, North-West University,
Potchefstroom, South Africa
Email: rhea.koch@nwu.ac.za
ORCID: https://orcid.org/0000-0003-2398-9475

Rhea Koch obtained her BA Hons in Psychology and her MA in Sociology in 2001. After working in the private sector for many years, she has recently returned to the academic world and is currently registered for her PhD in Health Science Education. She was appointed as an academic developer in 2021 at the North-West University on the Potchefstroom campus for a three-year project to decolonise the health sciences curricula. This project is managed by the Centre for Health Professions Education and funded by the UCDP. She has a keen interest in instructional design and collaborative online learning.

René Koraan

School of Law Undergraduate Studies, School of Law,
Faculty of Law, North-West University,
Potchefstroom, South Africa
Email: rene.koraan@nwu.ac.za
ORCID: https://orcid.org/0000-0002-9426-6517

René Koraan is a senior lecturer and director of Professional Development and Community Engagement at the NWU, Faculty of Law. As a former state prosecutor and advocate, Koraan's pragmatic approach to teaching and learning lead to initiatives like the annual internal, cross-campus NWU-Juta Mock Trial Competition founded in 2011. Koraan presented papers at various national and international conferences and also published in accredited journals and books. His accolades include the Rapport Inspiring Teaching Award in 2010, Rapport Top Lecturer award 2011, 2012, 2013, and 2014, the Teaching Excellence Award in 2011 and 2015, the NWU Spokesperson of the Year-Upcoming Incentive Award 2015, as well as the Juta Best Paper Award from the Southern African Law Teachers Conference in 2015, Scholarship of Teaching and Learning 2013–2014 and 2018. Koraan is also the established awardee in the NWU Excellence Awards for Community Engagement: Service Excellence in Sharing Expertise for 2021.

Nothile A.T. Kunene

Research Unit Self-Directed Learning,
Faculty of Education, North-West University,
Mahikeng, South Africa
Email: nothile.kunene@nwu.ac.za
ORCID: https://orcid.org/0000-0002-8219-8086

Nothile A.T. Kunene is a Mathematics lecturer in the Early Childhood Development Education subject group at the Faculty of Education, North-West University. Her main research focus within the Research Unit Self-Directed

Learning focuses on (word) problem-solving, problem-based learning, assessment, and cooperative learning. Kunene has received an Institutional Research Excellence Award and is currently involved in robotics and coding for the 4IR towards self-directed multimodal learning. She has published at the national level, and she also acts as a supervisor for postgraduate students.

Elize Küng
Education and Human Rights in Diversity (Edu-HRight) Research Unit,
Faculty of Education, North-West University,
Vanderbijlpark, South Africa
Email: elize.kung@nwu.ac.za
ORCID: https://orcid.org/0000-0002-3249-5517

Elize Küng (née Annandale) completed her PhD in Education Law at the North-West University in 2016. Before starting her career in higher education as a temporary lecturer at the Vaal Campus in 2006, she was an English educator. To date, her particular research interest focused on creating and maintaining successful South African public schools, and she is a member of Edu-HRight. Küng has always had a passion for community engagement and the important responsibility educators in particular have towards the community. In her current role, she has become increasingly interested in service-learning and the potential the experiential pedagogy brings to the training of teachers.

Celia Lourens
School of Law,
Faculty of Law, North-West University,
Potchefstroom, South Africa
Email: celia.lourens@nwu.ac.za
ORCID: https://orcid.org/0000-0001-7481-6297

Celia Lourens is an academic assistant and temporary lecturer at the Faculty of Law, NWU. Her main research focus is estate and financial planning. However, she has a passion for student development and is involved in many faculty programmes, including the first-year law student excursion since 2019 and the NWU-Juta Criminal Mock Trial Competition since 2016. Lourens holds two undergraduate law degrees, BCom Law and LLB, as well as a postgraduate LLM degree in Estate Law and is currently registered for her LLD. She is passionate about research in the legal field and educating the legal minds of the future.

Anitia Lubbe
Research Unit Self-Directed Learning,
Faculty of Education, North-West University,
Potchefstroom, South Africa
Email: anitia.lubbe@nwu.ac.za
ORCID: https://orcid.org/0000-0001-5687-1030

Anitia Lubbe has been working in the field of teacher education since 2011, and her research niche encompasses assessment, assessment literacy, cooperative

learning, and self-directed learning. Her PhD, entitled 'Cooperative learning-oriented assessment: Implications for students' assessment literacy and self-directedness in learning', is an amalgamation of her research interests in cooperative learning, assessment, and self-directed learning. She has published at the national level and acts as supervisor for postgraduate students. She is currently also part of three research projects with a specific focus on assessment for self-directed learning (SDL).

Elsa Mentz
Research Unit Self-Directed Learning,
Faculty of Education, North-West University,
Potchefstroom, South Africa
Email: elsa.mentz@nwu.ac.za
ORCID: https://orcid.org/0000-0002-7267-080X

Elsa Mentz is the research director for the Research Unit Self-Directed Learning, Faculty of Education, NWU. She is also a professor in computer science education and her main research focus is the promotion of self-directed learning through the implementation of cooperative learning. She has acted for extended periods as executive dean of the Faculty of Education at the North-West University. She is a NRF rated researcher and the editor of five SDL book publications. She has received several research awards, including the 2020 Malcom Knowles award for significant lifelong contributions to the field of self-directed learning and the 2020 Research medal of the Education Association of South Africa. She completed several funded research projects, has published on the national and international level, and acts as a supervisor for postgraduate students.

Gontse Mokwatsi
Hypertension in Africa Research Team,
Faculty of Health Sciences, North-West University,
Potchefstroom, South Africa
Email: gontse.mokwatsi@nwu.ac.za
ORCID: https://orcid.org/0000-0001-6203-3965

Gontse Mokwatsi is a researcher in the Hypertension in Africa Research Team (HART), Health Sciences faculty, North-West University. Within HART, her main research focus is the early development of hypertension, blood pressure monitoring, and arterial stiffness, especially in young South Africans. Gontse is also a senior lecturer within the Department of Physiology with teaching and learning responsibilities at first, third, and honours year levels. She also has an interest in student development and support to assist first-year students to transition into university life (academically and socially). To fulfil this role, Gontse is part of a first-year work-integrated learning project which uses online excursions for students

to focus on self-development, leadership, problem-solving, and professional identity. Gontse has published articles (as first or co-author) in internal peer review journals and is also a supervisor for postgraduate students (Hons, MHSc and PhD).

Jako Olivier
Research Unit Self-Directed Learning,
Faculty of Education, North-West University,
Mahikeng, South Africa
Email: jako.olivier@nwu.ac.za
ORCID: https://orcid.org/0000-0002-5860-6027

Jako Olivier is the holder of the UNESCO Chair in Multimodal Learning and Open Educational Resources and is a professor of Multimodal Learning in the Faculty of Education, North-West University. His research within the Research Unit Self-Directed Learning focuses on self-directed multimodal learning, open educational resources, multiliteracies, blended and e-learning in language classrooms, as well as multilingualism in education. He currently holds a Y rating from the NRF and was awarded the Education Association of South Africa's Emerging Researcher Medal in 2018. In addition to recently editing books on self-directed learning in terms of multimodal learning and open education, he has published numerous articles and book chapters at national and international levels, and he also acts as a supervisor for postgraduate students.

Neal Petersen
Research Unit Self-Directed Learning,
Faculty of Education, North-West University,
Potchefstroom, South Africa
Email: neal.petersen@nwu.ac.za
ORCID: https://orcid.org/0000-0002-4415-2853

Neal Petersen holds a doctoral degree and is a member of the Life Sciences Education group in the School of Mathematics, Science and Technology Education (and deputy director of the school) in the Faculty of Education, North-West University. Neal is a member of the Research Unit Self-Directed Learning at the same faculty. His main research focus is engaging pedagogies and contextualised learning, including indigenous knowledge in science education, first-year students' experience during a WIL educational excursion, cooperative learning, and teacher professional development in science education. He was the principal investigator of a project on using engaging pedagogies in science education, including the infusion of arts in science, technology, engineering, and mathematics education, moving towards STEAM education. He has published on the national and international levels, and he also acts as a supervisor for postgraduate students.

Gerda Reitsma

Centre for Health Professions Education,
Faculty of Health Sciences, North-West University,
Potchefstroom, South Africa
Email: gerda.reitsma@nwu.ac.za
ORCID: https://orcid.org/0000-0002-0569-6823

Gerda Reitsma completed her doctoral degree in Learning and Teaching at the North-West University in 2006. She taught undergraduate and postgraduate student teachers in the Faculty of Education, NWU until 2010, when she was appointed as academic advisor in Academic Support Services. She established and managed the Scholarship of Teaching and Learning programme on the Potchefstroom campus, promoting research in university teaching and learning in the different faculties. In 2014, she was appointed in the Faculty of Health Sciences with the purpose of enhancing the quality of teaching and learning and driving a research approach towards teaching innovation in Health Sciences. She established the Centre for Health Professions Education in 2017 and was appointed as the director until the end of 2021. Reitsma completed the FAIMER SAFRI fellowship in 2017, after which she was invited to become a faculty member to mentor and train health professions educators in sub-Saharan Africa. She served on the board of the SAFRI, SAAHE and AfrIPEN academic associations, aimed at enhancing the quality of health professions education. She was co-editor of the book *Trauma Counselling: Principles and Practice in South Africa today* and was also responsible for the learning activities included in the book. Reitsma received Excellence in Teaching awards twice during her time as a lecturer in the Faculty of Education. She was continuously involved in faculty development and mentorship and contributed to the revision of teaching excellence recognition processes at the NWU.

Elizabeth I. Smit

Research Entity: COMPRES,
Faculty of Health Sciences, North-West University,
Potchefstroom, South Africa
Email: elizabeth.smit@nwu.ac.za
ORCID: https://orcid.org/0000-0001-5474-7001

Elizabeth I. Smit is a senior lecturer and deputy school director in the School of Psychosocial Health. Her main research focus is on families, children, and youth, all medical and health-related issues, and school social work. She is avidly involved in community engagement and has been an advisor for Golden Key International, Mahikeng chapter since 2014, where she has received travel grants to Australia and Las Vegas respectively, and she is a board member to several community for a. She has a deep-rooted interest in teaching both the undergraduate and postgraduate students and has to date successfully supervised and completed five master's and three PhD students since 2016,

whilst also teaching undergraduates from first-years to fourth-years. Quite an extensive reviewer herself, she has reviewed 40 articles thus far and equally acted as an external examiner to close to 15 universities. She has received a category B for Teaching Excellence Award in 2014, and she is a member of a few associations such as the AISWG, based in New York, and ASASWEI, an association of social work educators, as well as other networks. Although not a member, she has attended and has affiliation with HELTASA and has attended SOTL workshops. Elizabeth was part of the team involved in the First Year Virtual 2021.

Lounell White
Research Unit Self-Directed Learning,
Faculty of Education, North-West University,
Potchefstroom, South Africa
Email: lounell.white@nwu.ac.za
ORCID: https://orcid.org/0000-0002-8243-339X

Lounell White was formerly a senior lecturer in the Faculty of Education at the North-West University, mainly responsible for the methodology courses within Life Sciences. She is now appointed as an extraordinary senior lecturer in the Research Unit Self-Directed Learning. Her main focus area is on incorporating indigenous knowledge and using engaging pedagogies within life sciences to enhance self-directed learning.

Getsia R. Zazo
Research Unit Law, Justice and Sustainability,
Faculty of Law, North-West University,
Mahikeng, South Africa
Email: getsia.zazo@nwu.ac.za
ORCID: https://orcid.org/0000-0002-6318-0358

Getsia R. Zazo is a lecturer in the Faculty of Law, NWU. Her main research interests focus is on criminal law, the law of criminal procedure, and the law of evidence. However, she also has a keen interest in researching domestic violence. Having previously worked as a prosecutor, she recently joined academia in 2020 and immediately developed an interest in developing students' skills through initiatives such as the first-year excursion and other programmes within the faculty.

Preface

Josef de Beer
Research Unit Self-Directed Learning,
Faculty of Education, North-West University,
Potchefstroom, South Africa

Elsa Mentz
Research Unit Self-Directed Learning,
Faculty of Education, North-West University,
Potchefstroom, South Africa

Neal Petersen
Research Unit Self-Directed Learning,
Faculty of Education, North-West University,
Potchefstroom, South Africa

Robert J. Balfour
Office of the Deputy Vice-Chancellor, Teaching and Learning,
North-West University,
Potchefstroom, South Africa

The COVID-19 pandemic severely impacted teaching and learning at higher education institutions (HEIs), and this book disseminates research findings on a series of cross-campus online initiatives of the North-West University (NWU) to ensure high-quality self-directed learning, whilst simultaneously attending to the need for inclusion and diversity in this challenging context. The golden thread running through the 13 chapters is how this HEI responded to the pandemic in a creative way through its investment in online virtual student excursions, based on problem-based, cooperative learning and gamification principles to support self-directed learning. Whereas virtual excursions usually refer to learning opportunities where 'a museum, author, park or monument is brought to the student' (Hehr 2014:1), the virtual excursion in our context is an activity system (Engeström 1987) where students' learning is scaffolded across the zone of proximal development (Vygotsky 1978) and where their 'social and pedagogical boundaries are stretched or expanded' (De Beer & Henning 2011:204). Students engage as *Homo ludens*, the playing human (Huizinga 1955), in learning activities embedded in an ill-structured problem, and through reflective activities, they are encouraged to reflect on their own naïve understandings or biases. This 'tension', or in Veresov (2007) parlance, 'dramatical collisions', provides a fertile learning space for self-directed learning.

In Chapter 1, entitled 'Cresting the wave: COVID-19's impact on reconceptualising higher education professional development', Balfour uses a wave as an analogy to reflect on the HEI sector's (and specifically the NWU)

responsiveness to the COVID-19 pandemic. Building on the work of Klein (2007) on the affordances of disasters in engaging in radical social and economic change, the author shows how COVID-19 has galvanised progressive as well as orbital practices and perspectives in higher education. This chapter provides context to the virtual excursions in which three NWU faculties have engaged in 2021, in response to the 'new normal' in the COVID-19 context, and how the institution continued to strive towards the promotion of self-directed learning amongst students.

De Beer and Geldenhuys, in Chapter 2, focus on the rhizomic development of the student excursion across three faculties in the NWU as multi-campus university. Utilising the person-process-context (PPC) model of Hiemstra and Brockett (2012), the authors show how the context in which the virtual excursion took place and the processes (teaching-learning activities) could enhance the development of self-directed learning attributes in students (the 'person' in the model). The authors contextualise the context element of the PPC model on a macro-level (within the teaching and learning framework of the NWU), meso-level (referring to the three faculties – Education, Law, and Health Sciences – involved in these excursions), and micro-level (the student's development, sense of belonging, and integration within the university). The chapter explores how such online learning environments in a multi-campus institution could be structured to provide opportunities for developing an inclusive identity as an NWU student and a sense of belonging within the unitary structure of a multi-campus university.

Chapters 3–11 focus specifically on the Faculty of Education's virtual excursion, Chapter 12 looks at the Faculty of Law's excursion, and Chapter 13 concludes with the experiences of the Faculty of Health Sciences' virtual excursions.

In Chapter 3, 'The affordances of face-to-face student excursions and implications for migration to virtual excursions', De Beer and Petersen provide a historical overview of the excursions and how the NWU migrated to virtual online excursions because of the global pandemic. Since 2007, research has been done (at the University of Johannesburg and elsewhere nationally) on the value of excursions for first-year student teachers in South Africa. De Beer, Petersen, and Dunbar-Krige (2012) highlight several advantages of such face-to-face excursions, such as improved student-lecturer relationships, students developing the ability to negotiate rules in culturally diverse groupings, developing sensitivity to cultural diversity, and exploring different semiotic tools for teaching and learning. De Beer and Henning (2011) show how the 'simulations characterising the excursions meet reality' and how the 'dramatical collisions' (Veresov 2007) which often emerge can scaffold learning and 'expansion' across the Vygotskian (1978) zone of proximal development. Petersen, De Beer, and Mentz (2020) show that the excursions sensitise

student teachers towards the value of cooperative learning for their own professional development and for their future classrooms. The COVID-19 pandemic resulted in the NWU having to consider alternatives to the traditional face-to-face excursions, and this chapter explores the conditions needed for virtual, online excursions to achieve the same outcomes and to enhance self-directed learning. The challenge is to create a learning space which is on the one hand supportive of student learning but on the other hand 'disruptive' in terms of challenging students to confront their own naïve understandings, biases, and prejudices. Whereas research has shown that the face-to-face excursions effectively managed to do so (De Beer & Henning 2011; De Beer et al. 2012; Sebotsa, Petersen & Speight Vaughn 2020; Taljaard 2018), the challenge is to create a similar learning space (engaged, interactive, and also self-directed) in an online environment. Sitte and Wohlschlagal (2001) argue that simulation games should make complex, challenging, or contemporary processes or contexts actable or liveable [*erlebbar*], thus invoking human experience within the rule-bound game or learning activity.

In Chapter 4, 'Developing capacity on several levels: Scaffolding learning, leadership development, and service-learning', Küng, Conley, and White focus on scaffolding learning, leadership development, and service-learning for senior students. During the virtual excursions, senior (third-year and fourth-year BEd) students acted as facilitators during the cooperative learning in the break-away rooms. Students who acted as facilitators were allowed to scaffold learning and leadership development through service-learning. The senior students previously attended the face-to-face excursions and thus had knowledge of the virtual programme offered. It is important for student teachers to experience leadership opportunities during their initial teacher education, to learn the art of building relationships within teams, defining identities, and achieving tasks effectively. It also provides an opportunity to learn to identify and display effective communication and interpersonal skills. Furthermore, this chapter also focuses on service-learning as an educational approach where student teachers are exposed to theories in the classroom and then volunteer with an agency, in this case, the professional development excursion. Reflection activities deepen their understanding of their own learning. Finally, this chapter explores the link between self-directed learning, leadership, and effective service-learning in a virtual environment, utilising cultural-historical activity theory (CHAT) on an institutional plane (Rogoff 1995).

In Chapter 5, 'First-year students' conceptions of the complexity of the profession, sense of belonging, and self-directed learning', Petersen, Mentz, and De Beer explore the affordances of the virtual excursion in terms of the professional development of student teachers. Teaching as a career is one of the most complex and challenging professions (Shulman 2004).

Although universities cannot train and completely prepare student teachers for all events or circumstances which they may encounter once they start to teach, universities can play a role to develop students' agency to address the eventualities and the constant change associated with life in the 21st century. In short, it means that universities should deliver student teachers that are self-directed, lifelong learners, and adaptable in order to be successful as teachers. Reality might pose a challenge to deliver such student teachers because literature indicates that first-year student teachers hold very naïve ideas of the complexity of their profession. Lortie (1975) referred to this phenomenon as the 'apprenticeship of observation', which suggests that these students have predetermined notions of teaching after observing their teachers for 12 years (or more). They think they can teach, without knowledge of what happened 'behind the scenes' before and after a lesson. To address the apprenticeship of observation, this mixed methods study reports on how the virtual educational excursion can be utilised to sensitise students about the complexities of teaching. Students are required to formulate personal learning goals for themselves. During the excursion, the student teachers were exposed to different aspects of the profession (such as lack of resources, unprofessional teacher behaviour, and social justice issues) and challenged to identify their own areas of development and to convert it into learning goals for themselves. The excursion therefore creates an opportunity for students to develop their own self-directedness. Because the excursion was scaffolded in such a way that the student teachers, from all three campuses of the university, worked in small diverse cooperative learning groups of five, the excursion also holds the affordance that the students learn from and with each other, learn to communicate and collaborate with different cultures to achieve the outcomes, and in so doing develop a sense of belonging as students at this university, although they came from different campuses. The preliminary data indicate that although the student teachers who participated in this excursion indeed hold naïve ideas of the profession, the excursion resulted in more nuanced understandings of the complexity of the profession and provided them with self-directed learning skills to identify their own learning needs and to take responsibility for their own learning. Whilst working together as a diverse group, they learn to communicate and work with different cultures, resulting in a sense of belonging as students from the same institution. In terms of self-directed learning, the quantitative data showed statistically significant improvement in all four domains of the self-directed learning instrument (Cheng et al. 2010), namely learning motivation, planning and implementing, self-monitoring, and interpersonal communication. Cultural-historical activity theory is used as an analytic heuristic to illuminate the findings of this research.

Chapter 6, titled 'Exploring virtual excursions for self-directed learning: A systematic literature review', provides an overview of research findings on

virtual excursions. Olivier and Kunene show that virtual excursions, as an iteration of the ever-increasing online-based learning and teaching activities, are becoming more popular, and in this context, self-directed learning could be regarded as an important aspect of the learning process. In this chapter, the authors focus on trends and characteristics from published works on online virtual excursions in terms of self-directed learning from the last 20 years. To this end, this chapter involves a systematic literature review conducted with a corpus of published works carefully screened based on set inclusion criteria related to virtual excursions and self-directed learning. The process then further involved an inductive thematic and structural analysis of the publications. From this research, an overview is presented on thematic and methodological aspects of discourses on virtual excursions, but the chapter also specifically considers how engagement with self-directed learning happens on such platforms. It is evident that the research relating to self-directed learning regarding virtual excursions is fairly limited and that many opportunities exist for future work in this context. The chapter concludes by presenting guidelines and research lacunae, based on the reviewed publications, for setting up virtual excursions that could promote self-directed learning as well as identifying appropriate learning strategies within this context.

The virtual excursions were built upon ill-structured problems. In Chapter 7, Havenga and Du Toit focus on problem-based learning in virtual spaces to promote self-directed learning. Problem-based learning is a well-known approach used worldwide as an active and constructive student-centred pedagogy that differs radically from traditional teaching methods. Increasing reliance on online teaching and learning in recent years necessitated a reconsideration of the design and structuring of problem-based learning to ensure its continued effectiveness in virtual spaces. This redesign explicitly endeavoured to utilise engaging pedagogies and foster self-directed learning skills to support students' learning in virtual environments. The purpose of this chapter is therefore to consider the adaptation of problem-based learning principles for online learning activities in virtual spaces, with a particular focus on fostering students' engagement and self-directed learning. The research is principally informed by a literature study and descriptions – based on personal observations and experiences during the virtual excursion – of how problem-based learning was adapted and implemented in a virtual environment in the first cycle of a design-based research approach. In addition, qualitative data in the form of feedback from students who participated in the first cycle of the adapted problem-based learning provides deeper insights into their experiences in the virtual learning environment. Based on the findings, recommendations are formulated for adaptation to problem-based learning to foster meaningful learning in virtual environments, most of which will be implemented in the second cycle of the longitudinal design-based study.

In Chapter 8, 'Students' experiences of cooperative learning in a virtual excursion', Lubbe and Petersen assess the role of cooperative learning during virtual excursions.

Various developments, including globalisation and an increase in the knowledge economy, are the driving force behind the need for more autonomous learners, capable of directing their own learning. Critical thinking and problem-solving, as well as good communication and collaborative skills are some of the crucial self-directed learning skills students need as part of their repertoire for the 21st century and beyond. Students are no longer required to be passive recipients of knowledge but rather active participants in their own knowledge construction. This social constructivist stance necessitates the use of more engaging teaching and learning pedagogies. Cooperative learning is a teaching and learning pedagogy that supports the social constructivist approaches as stated by Lev Vygotsky. Cultural-historical activity theory is therefore a suitable research lens and was used as an analytic heuristic. To establish an online workspace where first-year students can promote each other's learning whilst working actively together, the elements inherent to cooperative learning were explicitly built into all activities which formed part of the virtual work-integrated learning (WIL) excursion. The aim was to ensure that all group members actively contributed towards the shared group goal, taking responsibility for their own learning and communicating effectively. First-year students were randomly assigned to diverse online cooperative learning groups of five students for the duration of a two-day virtual excursion. The way in which cooperative learning was scaffolded during this virtual WIL excursion is driving this qualitative research. Qualitative data from students' feedback on their experiences of cooperative learning, as well as from students' peer and self-assessments were analysed in order to present practical guidelines in terms of future virtual WIL excursions. Preliminary data suggest that students perceived the way in which cooperative learning was scaffolded during the excursions as valuable towards their learning process and progress.

The virtual excursions also made use of the principle of gamification. In Chapter 9, Bunt, De Beer, and Petersen explore the affordances of gamification in the 'Famine and Abundance' game during the excursion for Education and Law students. Gamification is a design technique that creates game-like interactions to promote various tasks and behaviours. Gamification has received much attention in the last decade, particularly in education. The practice of gamification of education and learning is only growing, thanks to technology developments that enable more digitised learning settings as well as the utilisation of capabilities created in connection to video games to generate engaging and compelling learning experiences. The benefits of its use include aiding cognitive and even physical development, increasing levels of engagement and accessibility, as well as self-directed learning. Over the past few years,

Education students have engaged in the 'Famine and Abundance' game during face-to-face excursions. The focus of this activity, where students as *Homo ludens* [the playing human] (Huizinga 1955) explore aspects of social justice and inclusion, holds affordances as a fertile learning space to address personal biases and preconceived ideas (Sebotsa et al. 2020). It thus sets the stage for students to identify personal learning goals for themselves as self-directed learners, in their quest to become truly inclusive 'super-teachers'. In 2021, the game has been modified as an online activity, utilising gamification, and this chapter shares findings on students' experiences of engaging in the digital 'Famine and Abundance' game. The data showed that students valued this learning experience, as 'games' were the fourth biggest highlight mentioned in students' feedback.

Lubbe, Olivier, and Hay focus on assessment through e-posters in Chapter 10. A major challenge is identifying assessment instruments for group work that not only support students' learning processes and progress, but also reflect valid and reliable results based on individual efforts. This chapter discusses the use of electronic posters (e-posters) as a multimodal assessment instrument for virtual excursions and involves a review of relevant literature on the use of posters as an assessment embedded in a cooperative learning task. The successful implementation (including the planning, facilitation, and related assessment) of group work remains to be labelled as being problematic, and even more so in an online learning environment. Assessment, furthermore, continues being the most important influencer of learning. Central to this research is the value of posters as a multimodal assessment instrument, contributing towards the promotion of much-needed self-directed learning skills (i.e. critical thinking, communication, and deeper learning). This focus on self-directed learning contributed to the use of posters as a summative assessment instrument during virtual WIL excursions. Students had to construct an e-poster within their assigned cooperative learning groups. The e-posters encouraged first-year students to identify problems and summarise possible solutions in a concise multimodal format, using text and other modalities (e.g. pictures). The e-posters were assessed using a rubric, which allowed a team of markers to grade the posters in relation to students' ability to articulate and justify possible solutions to identified authentic problems. Peer- and self-assessment methods were also implemented and contributed to the final e-poster grading. Qualitative data from students' peer- and self-assessments as well as the multimodal e-poster artefacts were analysed in order to present practical guidelines in terms of the implementation of e-posters as an assessment instrument for future virtual excursions.

The virtual excursion facilitators quickly realised the importance of constantly adapting the excursion programme based on students' needs. In Chapter 11, '"Withitness" in the virtual learning space: Reflections of student teachers and teacher educators', De Beer, Petersen, and Conley reflect on

Kounin's (1977) construct of 'withitness', and how it relates to the online learning environment. Kounin described withitness as the teacher's ability to be perceptually and cognitively alert and aware of all aspects of teaching and learning in his or her classroom at all times. Very little has been published on withitness in an e-learning context. Notar and Sorbet (2020) describe withitness in e-learning as awareness (presence), adroitness, clairvoyance, keenness, maximum engagement, perception, planned variety, rhythm learned through teaching, experience, vision, and wisdom. This chapter explores teacher educators' experiences of withitness during the facilitation of the online virtual student excursions. The authors also draw on the feedback from students, who indicated that they had appreciation for the engaging pedagogies and online presence of the professors engaged in the virtual excursions. Virtual learning is assessed in this chapter according to several Kounin (1977) constructs, namely withitness, the ripple effect, overlapping, momentum, smoothness, and group alerting.

In 2021, the Faculty of Law also involved their first-year students in a virtual excursion. The authors of Chapter 12, Crous, Koraan, Lourens, and Zazo, focus on the design principles for such law excursions. First-year law students are already forming their own identities as legal professionals. The purpose of the excursion was to enable first-year law students to have more nuanced understandings of the legal profession. Students also acquired a variety of skills relevant and necessary for practice. In planning this excursion, the challenge was to build a virtual excursion that was in line with these outcomes. The online sessions were planned according to the overarching theme of social justice and diversity. The ice-breaker session exposed students to a factual scenario that required self-directed learning. Students worked in groups, with special emphasis on student-centred problem-based learning. Interactive sessions were presented on effective communication and ethics, as it is integral to the legal profession. These were further supported by informative sessions from legal practitioners. The 'Famine and Abundance' game referred to in Chapter 9 was adopted as the 'Hunger Games' in the context of the Faculty of Law, and it made students cognisant of the social injustices within different communities and the impact of such on individuals. From the gender theory workshop, students were able to understand the intricacies of gender. The sessions on leadership provided students with the opportunity to identify their qualities and to reflect on how this relates to others.

The Faculty of Law's virtual excursion was a success which developed each student's ability to interact and collaborate effectively with others, work as part of a team, and set individual goals as self-directed learners. At the end of the excursion, students had a better understanding of the role of the lawyer as an agent of change and what it means to strive for inclusion and social justice.

The book concludes with the perspectives of the Faculty of Health Sciences, which also exposed their first-year students to virtual excursions in 2021. In Chapter 13, Reitsma, Hanekom, Smit, Mokwatsi, Koch, Brits, and Heymans show how the transformation from face-to-face interactions to online environments, because of the COVID-19 pandemic, disrupted the higher education environment in many ways and how the social integration and the development of professional identities of first-year students are of particular concern. The Faculty of Health Sciences is a complex multidisciplinary faculty, providing programmes in several health professions (Sport Sciences, Biokinetics, Recreational Studies, Physiology, Consumer Sciences, Dietetics, Occupational Health and Safety, Nursing, Psychology, Social Work, and Pharmacy). Most of these qualifications include some form of WIL as part of the professional development of the future health professional. The challenge was to design a virtual WIL learning experience that will accommodate these professions in terms of focus and outcomes that are relevant and applicable to all these health professions and on a level appropriate for first-year students. An interprofessional team of health science academics, an online design expert, and a graphic designer worked collaboratively to plan and create a virtual first-year WIL excursion, based on the principles of design thinking. In this chapter, the practical application of the design thinking principles (empathy, define, ideate, prototype, and testing) in planning and creating the virtual WIL excursion is described. The design team demonstrated competencies associated with the design thinking process, such as the ability to navigate ambiguity, empathise, embrace diversity, synthesise information, make decisions, and create tangible content. The team focused on clear communication, not only during the design process, but also in the designed virtual project, where different stories, ideas, concepts, reflections, and learnings were integrated to accommodate the diverse health science student group. Ultimately, the design thinking approach resulted in a project where the people (interprofessional design team and students), tools, and techniques (software, graphic design skills) were combined successfully in the design of a virtual WIL excursion project for the health science first-year students.

In conclusion, it is our belief that this nascent scholarship concerning the affordances of virtual online excursions to foster self-directed learning may lead to rhizomic research in other fields and at other HEIs as well.

Cresting the wave: COVID-19's impact on reconceptualising higher education professional development

Robert J. Balfour
Office of the Deputy Vice-Chancellor, Teaching and Learning,
North-West University,
Potchefstroom, South Africa

■ Abstract

After two years of the pandemic, it seems trite to point out that COVID-19 has upended expectations as regards conventional forms of contact teaching and learning, in which face-to-face student and academic interaction was the primary feature. Yet, globally, the pandemic has hastened both actions and reactions to the need for online education that are, on the one hand, welcomed as manifesting a long-awaited revolution in teaching and learning, and on the other hand, feared as a dilution of the learning experience. This chapter considers the wave-like aspects of the COVID-19 crisis, with an analysis of

crisis planning more broadly at a South African university, and it extends the analogy of the wave to describe progressive as well as orbital trends in thinking about university classrooms as the sector attempts to exit emergency remote teaching-learning. What emerges is the need for systemic and sustained professional development and support for academics as teaching-learning experts in the post-COVID-19 classroom of the future.

■ Introduction

This chapter considers COVID-19 as a crisis defined within a particular understanding of normalcy within education systems and institutions. The chapter focuses in particular on one South African institution, which (like all institutions in the sector) was affected adversely by COVID-19 in terms of its operational functioning with a view to continuing through the period of 2020 and 2021 to provide education programmes. This provision is understood to entail not only the support needed by staff in the offering of programmes, but also the students' success in accessing and completing the academic programme during a period of extended crisis characterised by disruption. This context is viewed through three lenses: firstly, through the lens of a global perspective on disaster and its 'affordances' as described by Klein (2007) in *The Shock Doctrine.* By exploring disaster or crisis through such an analytical frame, one is able to assess the extent to which more localised responses align with or contrast to international trends in the context of contingency planning. Secondly, this global perspective is further contextualised through the development of an analogy that captures something of the features of COVID-19 as a crisis and then also the features of wave-like thinking within the institution about the planning and responsiveness needed to manage and be resilient in the face of the crisis. Thirdly, the analogous conceptualisation of the wave is considered in relation to reflections on the responsiveness of planning and the experiences of teaching-learning practices in relation to the (present as well as potential) affordances of technology. The chapter concludes on a note of careful optimism in relation to the reflections afforded in education terms by the experiences of COVID-19.

Why utilise the analogy of the wave in the context of education responsiveness to COVID-19? Analogies relating COVID-19's wave-like behaviour are utilised as a means of understanding the differences between erratic natural disasters such as Hurricane Katrina (2005) and COVID-19, which has taken the form of at least four 'predictive waves' at the time of writing this chapter. Furthermore, COVID-19-related waves cannot be considered events in isolation from each other (as a hurricane or malaria outbreak might be considered as an event, even if they are frequent in occurrences in most parts of the planet). The reasons for this are: firstly, the development of virus variants bears a direct relation to the extent to which communities and societies have been able to isolate and protect members

through compliance with regulations; secondly, the development of variants in the literature bears a direct relation to relative success or failures in maintaining physical distancing, sanitation, and other health-related protocols. Early variants have thus played a role in the development of mutations as well as new variants. In relation to education and the impact of COVID-19, the analogy of the wave is used to understand responsiveness and the oscillation between the desire by educators and even institutions for a clean (future) slate, on the one hand, when contrasted with the need to salvage (what was best) from the past to rebuild towards a better future. Thus the 'wave' analogy is apposite to both the virus and education institutions' responsiveness to the waves and their own wave-like reflections. The wave's orbital and progressive patterns are shown also to be evidenced in ways of thinking about teaching-learning in the COVID-19 period and the implications thereof for academics such as university teachers. In particular, the chapter argues for the need for prioritisation of academic professional development specifically in relation to developing agility, responsiveness, and resilience in the face of disruption that extends beyond the temporary, with implications for the longer-term success of the academic project in volatile contexts.

Having considered the structure and analogous frame of the chapter, I want to return to Klein (2007) and the 'possibilities' offered by crisis from the perspective of planning for or intervening in communities. Klein expresses a degree of disbelief in using 'moments of trauma to engage in radical social and economic change' (Klein 2007:8). Analysing three decades of neoliberal interventions in national economies around the globe, she describes the impact of economic and social (including educational) reforms arising from a selection of national or natural disasters. Klein finds a relationship between crises and the ends to which crises are used in the period of late 20th-century capitalism. In brief, she argues that the occasion of crisis can be constructed or accidental opportunities (understanding, of course, that factors leading to natural disasters like global warming are in themselves not always natural) and that the subsequent actions to which societies commit themselves in terms of crisis are both responsive to the event of the crisis itself and opportunistic. Klein (2007) suggests in her accounts of over 40 national crises in *The Shock Doctrine*, for example, that state-endorsed economic and social reforms adopted in the aftermath of crises are shown to be motivated largely by private interests on the back of political agendas, in which all manner of social benefits come to be reversed in favour of privatisation. Education is one such commodity which has become increasingly privatised in relation to the promise of technology enhancing access and thereby leading to enhanced performance. For Klein (2007:465), the tendency to believe too easily in the affordances of capitalism feeds off the fear of disorder and anxiety occasioned by disaster: 'the universal experience of living through a great shock is the feeling of being completely powerless'. In a chilling account of the impact of Hurricane Katrina, for example, she describes how influential policy advisors

to the US government counselled using the crisis to disband the public schooling system (long perceived to be overly unionised and under-performing) in New Orleans in favour of privatised education through charter schools. The consequence was not only the destruction of the teacher unions in the city, but also the laying-off of hundreds of teachers; youth unemployment soared, as did the rates of out-of-school youth. The advice was that the privatisation of education could be motivated based on a need for better quality of teaching on the one hand and better performance of the education system on the other. Hurricane Katrina thus became an opportunity for restarting with a clean slate by removing 'problem' populations (students as well as teachers) from the future. Klein (2007) argues that:

> [*L*]ocal [...] renewal [...] begin(s) from the premise that there is no escape from the substantial messes we have created and that there has already been enough erasure — of history, of culture, of memory. (p. 465)

This reference, in the context of South Africa's education system (which is widely understood to be ineffective and inadequate) (Spaull & Jansen 2019), deserves quiet reflection as well as persistent remedial action. If COVID-19 has demonstrated anything about the impact of a crisis on the social and economic fabric of a society, it is the vulnerability of education for children and young adults, in the context of the social and economic impact of the virus on an already strained education system and teachers: the impact on teaching-learning quality, access to resources and connectivity, and the opportunities of socialisation and connection have all been documented as disasters for the education system in South Africa. The shock of the now is prescient too of future shock (Paton 2021) for South Africa's youth especially.

Systemic as well as disruptive crises are a powerful feature of the post-apartheid period in South Africa. Contextualised within a global space, Klein's (2007) *The Shock Doctrine* provides a grim account of the many disastrous uses to which crisis and shock can be turned. Importantly, as noted earlier, she describes two social impulses: the impulse to start with a clean slate and the impulse to rebuild from what can be salvaged. By alluding to Klein's work, I argue that the perception of the crisis demands a wider context to understand both the social and systemic aspects of even a singular disruption, because even if COVID-19 is considered an event, rather than a series of viral waves, the impact of disaster helps shape also the responses taken to address it in the short- and longer-term.

There are also different kinds of crises (Balfour 2021);[1] Since 2007, when load-shedding shifted from being an occasional emergency to a normal

---

1. Part of this chapter is drawn from Balfour's conference address which is also quoted in the North-West University (NWU) digital news repository, and which is not to be found in any other previous subsidised research output by the author (this address is referenced).

experience, universities had to develop plans for disruptions relating to the shortages of power and water supplies for their campuses (Hartleb 2008; Wikipedia 2021). The power outages and their associated costs became a part of university budgets since then. Properly considered, these instances, routine as they may have become, can be considered as disruptions rather than emergencies: they moved from being short-term crises to become manageable occurrences thanks to the application of the university's technical (and human) expertise.

By mid-2015, another crisis affected both the sector, this time in relation to student funding (#FeesMustFall; Jansen 2017), and the experience of students feeling isolated from and marginal to university culture and the curriculum. This crisis took the form of an extended disruption to university campuses across the country and was underpinned by unsustainable fee increases, abnormally high levels of student debt, and systemic inefficiency. Properties were damaged, and face-to-face lectures and tutorials were suspended on many campuses including those of the NWU. #FeesMustFall initiated a new normal in terms of the role the National Student Financial Aid Scheme has come to play in funding university students. This movement also brought calls to decolonise the curriculum to centre stage in discussions of curriculum reform and transformation.

From developing a sophisticated electricity supply capacity to dealing with power and water supply issues, and from being a university where at least a third of the students were self-funded to an institution where most of the students are state-funded through the national bursary scheme, universities had to plan for major change. At NWU, in relation to decolonisation of the curriculum, the academic leadership worked from the Senate-approved Declaration of University Education (2018) (NWU 2018) to drive decolonisation with explicit programme references within faculty-integrated teaching-learning plans. Cogent and explicit planning can have benefits: for example, throughout this period, and specifically in the last seven years during such remarkable change, the university has improved year on year in terms of its international rankings. It has risen to number 5 status amongst South African universities, with subject areas featuring in the world's top 100 institutions in 2021 (Staff Writer 2021), suggesting that it is remarkably well positioned to face a rapidly changing future. This came to be tested during COVID-19.

In previous instances of crisis, the purposes of university plans were to mitigate the risks associated with disruption with a view to maintaining the university's ability to deliver on its core business, even in the context of 'business-unusual'. Notwithstanding the intention of plans, it must be acknowledged that crisis has a powerful way of upending the old normal and, in so doing, changing the core business and how to perceive and further conceive of it. In terms of crises, then, the development of COVID-19 is both similar and different to what was experienced previously: COVID-19 began as

a disruptive emergency, but it has not been a singular or repetitive series of crises. Its sustained longevity makes it unlike anything experienced in the recent past, and this presents a conundrum in terms of how the university (indeed the sector as well as state) responds to it. Put simply: how one defines the crisis in large measure determines the strategies, resources, and energies that need to be developed, organised, and focused in order to address it. These elements such as 'strategies', 'resources', and 'energies' are a normal part of how institutions plan, and thus shifting conceptualisation from crisis-oriented planning towards a (redefined) plan for normalisation is potentially enabling (rather than only threatening) for the university. This perspective may be more generative in terms of developing longer-term resilience, assisting leadership to refocus efforts as regards wellness, and redefining the whole range of face-to-face interactions typical of a university. Resilience, wellness, and interaction are core also to teaching-learning support (of staff as well as of students) towards a better quality of engagement in which face-to-face presence, online presence, and asynchronous engagement feature.

◼ Understanding the wave and COVID-19

The analogy of the wave is not arbitrary, because the discourse surrounding COVID-19 has been one which has been preoccupied with the wave: first, second, third, and fourth waves in 2021, with the promise of a fifth wave occurring by mid-2022 with crests, troughs, and dissipation. In a definition borrowed from the *Water Encyclopedia* (Lehr et al. 2005), a wave is considered 'a cohesive force' characterised by 'capillarity'. 'Capillarity holds the water molecules of the ocean surface together, allowing fish and objects to be supported. Capillarity is the initial restoring force for any body of water'. In terms of COVID-19 and society, and for the purposes of this chapter's focus on education, capillarity is the social cohesiveness of a learning community termed the university, in the context of waves associated with the virus. In pre-COVID-19 times, the kind of winds that blew across the higher education sector were those associated, for example, with social developments (apartheid, its demise, and the rise of the democratic era, the rise of feminism and the decline of imperialism in its colonial forms), or economic developments (e.g. the demise of socialism and the onset of neoliberal capitalism – see Baatjes 2005 on this theme). These winds have been dramatic longitudinally and are, for the most part, able to be traced historically across decades of social or scholarly development. They too affect 'capillary waves', forming initially as ripples and gathering momentum before dissipating on the beach. By contrast, COVID-19 is something akin to a quake, creating additional pressures (waves) beneath the water to distort capillarity and exacerbate certain challenges on the surface, whilst seeming to offer innovative approaches or solutions to others. COVID-19 affected, for example, the

relationship in this period between contact teaching and technology, with implications for the educational (professional) development of university teachers. In the context specifically of COVID-19, this focus remains under-explored, and in a recent survey of 31 COVID-19 responses by higher education institutions (HEIs) (Bergan et al. 2021), all but two of the chapters focused on the 'what we did to get through COVID-19', or what should be done by academics and students afterwards rather than on reflection concerning 'what worked well' and why. This suggests that globally, the higher education sector is still very much concerned with immediate contingency responsiveness to COVID-19, whilst increasingly the need is felt for critical and scholarly reflection on the quality of such responsiveness in educational terms.

Winds and gravity, what occurs above as well as below, give rise to progressive and orbital movements in waves. But even if the visual images of waves suggest progression in a direction, this itself is illusory: water does not actually move that much because the water remains cohesive from crest to crest. The orbital nature of waves is not evident to the eye but occurs instead beneath the water. Within this analogy, what represents the shoreline in terms of educational experience with COVID-19 (i.e. the breaking points)? In education terms, are the coastlines those limitations against which waves crash or shores on which they dissipate? Issues like quality, performance, and relevance? Access, sustainability, and social inequality? Typically, the steeper the incline of the land leading to shore and the stronger the wind, the more velocity a wave will gather as it rushes towards its breaking point. The natural inclination of wave capillarity is stasis, a level and flat body of water, but crucially, progress or movement comes with disruption.

◼ COVID-19 as progressive and orbital waves: Society, higher education, and disruption

In the same way that understanding the discourse of the wave in relation to the pre-COVID-19-normal and the new normal, any nostalgia for a return to the old normal should be met with careful reflection and scepticism. In relation to the old normal, Solnit reminds the reader that 'ordinary life before the pandemic was already a catastrophe of desperation and exclusion for too many human beings, an environmental and climate catastrophe, an obscenity of inequality' (Solnit 2020:1). Pre-COVID-19 was also the age of academic mobility in the form of the international conference circuit in exotic locations, the mobility of student and staff exchange, all of which disappeared in 2020 and 2021 and which frankly was costly in terms of the carbon footprint. Yet in the post-mobility international period, internationalisation remains just as important, if not more so, because of the need to create partnerships to address many of the world's still-pressing challenges. What has also been observed in relation to a nostalgia for the old normal is the wish, expressed by

parents and funders, for a return to large group teaching, even when (just like the wild conference circuits of yore) the cost and the consequences far outweigh perceived benefits. Thus in COVID-19 can be seen those wave-like behaviours that are orbital (i.e. circular) motions and which exist to some degree in tension with the progressive directions taken in education before COVID-19.

Other social issues such as gross inequality and current (still) high unemployment place human existence still in a state of precarity, even if the availability of online education taps into a deep desire for 'more flexible modes of learning and [increased] access for long marginalised groups' (Munck 2021:33). This educational promise is important to reflect upon now because despite the negative impact of COVID-19, *The Economist* (2020), for example, has predicted that learned behaviours which have proved more effective during the COVID-19 period are not likely to be relinquished easily. What to retain and what to relinquish is thus both an educational and social opportunity.

If one extrapolates from that claim to the world of higher education, one sees these same phenomena in relation to online learning, in which many academics have not only become adept in terms of managing online learning, but also reluctant to return to contact teaching in general and large group lectures in particular. Thus, for the success of managing the transition during a period of crisis to online teaching and learning (Regehr & McCahan 2020), a darker side is evident. Not all newly learned behaviours are positive in student academic life either: even if the university has been successful in providing learning programmes online, reluctance amongst students to engage with online learning material at their own pace and within their own control has also been observed (Swanepoel, Yu, & Beukes 2021). As noted later in the chapter, the reluctance of some academics to return to in-person contact with students is similarly evident. Add to this students' reluctance to engage with teaching-learning materials made available online, and it becomes clear that these are two sides (academics and students) of the same coin (contact) but with distinct differences and one compelling similarity. What is held in common between the two sides of this coin is contact, but it is not the contact which the university experienced before COVID-19. Sections to follow consider how to define that contact in education terms in the pre-COVID-19 period so as to understand the complexity of the contact needed from a professional development perspective going forward (the orbital movement of the wave in tension with its progressive direction). This investment is also not an investment necessarily in a return to the old normal in terms of contact but may have implications for the development of academic's teaching-learning competencies and skills going forward. It is worthwhile, then, problematising contact in light of the old as well as the new normal.

◼ The old normal (orbital) and new normal (progressive) massified classrooms during COVID-19

Firstly, the notion of pre-COVID-19 contact teaching within a massified education system is illusory and problematic in terms of teachers' experience of massification and also student academic performance and experience arising from COVID-19. Massification in the context of the classroom is also considered a challenge in the scholarship of teaching and learning the world over (consider, e.g. the work done by David Pedder on large group teaching-learning since the 1990s). For HEIs, massification has infrastructural, physical and experiential components: huge lecture venues were built over the last 20 years across South Africa at the cost of millions (of rands), and lecturers have been engaged with group sizes easily exceeding what could reasonably be managed in terms of achieving contact with students to the extent that learning could be guided rather than managed, facilitated rather than taught in the transmission mode. Thus, the infrastructural massification of university classrooms replicated the overcrowding of schools and conformed ironically to the prescripts of neoliberalism (in which education is a commodity – see Vally 2007 on this theme), rather than to any notion of education as prized in relation to its relevance, accessibility and quality. In this context, the majority of children did not and could not have received the attention needed to succeed at school. Variables affecting performance include the quality of teachers, teacher training, poverty and class inequality, syllabi written and taught in only two of the country's 12 languages – including sign language, introduced as the 12th official South African language in 2022 approved by President Cyril Ramaphosa and his cabinet within the Constitutional Eighteenth Amendment Bill – literacy and numeracy seeming to improve annually but resulting still in mass illiteracy, and declining participation in the sciences and mathematics (CHE 2013). Gathered together, these variables are like a swell on the ocean of society, amplified in the pre-COVID-19 packed mass-lecture theatre and exacerbated further in the COVID-19 online modality (see Howie for a discussion on literacy levels and COVID-19 in Shoba 2021).

How thus to enable access whilst simultaneously guaranteeing engagement is the challenge. Envisioning the university as a community-based and community-centred resource depends on the extent to which access to technology, knowledge and academics can not only be made possible but also transformative (aspects of these possibilities are explored insightfully by Tella & Motala 2021). At best, universities have been able to 'keep things afloat', but this in itself is not enough momentum to carry the sector forward in terms of better teaching and more inclusive and decolonised curricula. In the new normal, the massified classroom has not disappeared. It has rather been re-engineered

using technology in two different modalities: the first is the mass-online classroom in which online teaching and learning can occur for groups in excess of what any lecture theatre can hold, whilst the second is an asynchronous and prerecorded lecture available anywhere, anytime for the students to view and listen to. Whilst the pre-COVID-19 sector focused on erecting large buildings, neither of the COVID-19 technological affordances had been planned for or experienced (with the exception of the distance education modality) on such a wide scale, and unsurprisingly both the old normal and new normal approaches to large groups have remained essentially teacher-focused, in which the transmission mode of teaching was and is the 'fall-back' position although transmission teaching has been widely discredited in favour of communication, collaborative, and cooperative learning (Johnson & Johnson 2018). Nevertheless, there are available excellent and recent examples of the successful uses of technology, as shown at NWU in chapters in the book (e.g. ch. 3 and ch. 7, among others), for highly interactive and effective small group learning within the larger group in a way that was simply not possible (as effectively) in the old normal of staggered lecture venues and fixed furnishings. It is important here to recognise that it is not class size in itself that is problematic, but rather the pedagogies adopted by the teacher where class size becomes the 'excuse' for transmission pedagogy. This risk requires a response for intensified professional development, as discussed in sections to follow.

◼ Crisis and the professionalised academic

As suggested earlier, a crisis is per definition unpredictable, and its capacity to refute the best-made plans in ways that potentially (within the teaching-learning area at least) shake up classroom practices for better and worse. For example, on the one hand, remote teaching-learning can easily lead to an over-reliance on lecture-talk whilst simultaneously making more precarious the opportunities and facilities for online student group work. The paradox of being connected without experiencing inclusion is a tangible one in online classrooms, where lecturers speak to faceless and possibly very quiet student profiles. On the other hand, many students have really benefitted from the flexibility and dynamism of effective digital teaching (pass rates went up at NWU in 2020 and 2021 and dropout rates have been at an all-time low). Crisis during #FeesMustFall and during COVID-19 has also changed the basis for the conceptualisation of key drivers within the NWU Teaching-learning (NWU TL) Strategy; for example, COVID-19 compelled NWU to rethink what self-direction meant in its Teaching-learning Strategy (2016–2020), that is, within a context where social isolation can undermine the motivation and self-discipline needed for effective SDL.

As COVID-19 has endured, the university has had perforce to move from contingency planning to consensus continuity planning in the face of not a

short-term disruption, but rather a prolonged crisis, and this latter aspect is what I would identify as the most critical challenge going forward. In relation to the Canadian environment, Regehr and McCahan note with COVID-19 that initially, 'in the absence of definitive direction, staff have been forced to plan and offer academic programmes without a clear vision of what will happen next' (Regehr & McCahan 2020:111). Thus the re-articulation or further refinement of the university's direction (the NWU Strategy) and the approaches (i.e. plans) to support COVID-19-sensitive realisation in a period of crisis are necessary both for the present and the future. Thereafter, although by no means a secondary consideration, the university needs to be engaged with defining and providing the support needed to make the transition from the precrisis Strategy and plans for staff and students to the in-crisis support and the creation of inclusions even when teaching is 'emergency' and 'remote'. In order to manage the changing nature of the COVID-19 waves, the university took the approach of reviewing and adjusting in every semester its faculty assessment plans as well as its faculty reintegration plans for both staff and student return to campuses – a necessarily dynamic and responsive process involving a close and synergistic relationship between management and governance structures of the institution.

The terms 'emergency' and 'remote' are all too familiar for many South Africans, even before COVID-19. South Africa remains a deeply unequal and fragile society (Klein 2007); inequalities are reflected in South African online and physical classrooms (Kajee & Balfour 2011). In 2020 as well as 2021, society gradually awakened (perhaps with dismay) to the realisation that what was perceived as an immediate crisis had given way to a period of prolonged uncertainty in relation to COVID-19, with devastating consequences for employment, household survival, political stability, and basic freedoms (such as the freedom of movement). Regehr and McCahan (2020) describe the Canadian experience in ways that also resonate with the South African experience at NWU when they detail how the University of Toronto dealt with COVID-19, shifting from expanding the expertise around the table to creating and expanding communications routines and the like. Our focus in terms of crisis continuity planning has become consensus driven (hence the term 'continuity consensus') through the informal but widely participative structures which have had to be created. These frequent and routine engagements by the academic and support leadership have come to focus more carefully in 2021 on the creation of a better quality of online delivery, characterised by support for student-connectedness and engagement, exploration of credible approaches to and software for assessment, and expanding the availability to accessible teaching-learning support, teaching resources, and learning support. All of the latter are premised on an understanding of the professional support made available to academic as well as support staff to create and sustain an engaged student experience online.

From the crisis there emerges teaching-learning. Four themes have an unanticipated longevity and invoke a radical rethink of teaching-learning: one such theme is staff-resilience (and this is associated with both professional competencies of skills development support and wellness), together with a focus on teaching-learning that also develops student-resilience. Another theme coalesces around the prominence accorded to teaching-learning support and in particular the need not only for accessible and useful teaching-learning technology, but also for adequate education technologists to support academics in relation to curriculum design for online environments. Uses and conceptualisations of the use of space and place (whether offices in terms of dedicated personalised or shared spaces in terms of remote working) form the third theme. How has face-to-face interaction changed for the university, and how might university spaces enable teaching online as well face-to-face teaching or block teaching? In a technology paradox which is also an educational irony, there arises a risk to almost all theoretical development and philosophical thinking about education, including the long-held beliefs in the efficacy of student-centred teaching and self-direction in learning development. Face-to-face teaching has become at once more personalised and paradoxically also teacher-oriented: along a continuum, there are extremes from live Zoom or Teams sessions in which face-to-face contact (or even eye contact) is almost impossible to offline learning in which the Learning Management System (LMS) risks becoming a kind of upload-download learning 'simulation', where the teacher is almost entirely absent or disembodied, featuring only in a prerecorded PowerPoint, podcast, or study guide notes. Critically, the nature of social relationships between academics and students also thus needs reconceptualisation and affirmation in the context of new conceptualisations of (online and physical) space. A fourth theme emerges on the future of assessments: upended is the conventional wisdom on assessment with its focus on formative and summative assessment types, all of which had to come to grips with the COVID-19 experience and 'morph' or transition to the NWU's approach to continuous assessment. Coupled to this theme are serious anxieties: academics' anxieties about large-scale academic dishonesty, the development and uses of proctoring software, and students' anxieties experienced with connectivity and data issues, whether on or at a distance from the campus. Such experiences are not unique to NWU; they are confirmed in the global scholarship on the impact of COVID-19 on teaching-learning and student life in higher education. Studies undertaken by the Council of Europe on Higher Education demonstrate that whilst education technology is familiar to students, it has proved challenging to use such technology in unexpected contexts (the home, the remote location) which are not set up for teaching-learning (Napier 2021:277).

These four themes do not exist in isolation, but rather accentuate existing inequalities in South Africa and affect HEIs differently: in acknowledging this,

the issue of access for success remains critical given that the education system in South Africa remains uneven and unequal. The challenge of managing and supporting the teaching-learning of the university in ways which mitigate the risks (of exclusion, isolation, and disengagement) for students who are different (depending on their class, geographic, and socio-economic backgrounds) cannot be underestimated. Technology use is not inclusion or an engaged student experience in itself. It is through the pedagogic creation of spaces for interaction, reflection, and proposed action that professional development short courses make a valuable contribution to affirming the relevance of communities of professional practice, as well as through opportunities to collect and listen to shared experience in the form of special colloquia, seminars and conferences. Between contingency and continuous-consensus planning meetings, 'risk register' reports, and progress updates on the NWU's Annual Performance Plan, the university leadership must afford for academics, academic leadership, and students and support staff alike an opportunity to come together to listen and talk through ideas about how to move forward and in which directions to place particular energy, collective wisdom, and resources, not in an introspective manner alone, but also aware of how peer institutions have addressed similar challenges nationally and internationally.

What is heard from students (and staff) in the COVID-19 period, at least within the NWU as the institution focused on in this chapter, is the overflow of communication, not always consistent, about expectations in terms of teaching-learning, the congestion of assessment due dates, and the multiplicity of assessments in a period where the conventional summative assessment has become the affordance of mostly those programmes regulated through statutory and regulatory bodies. Beyond COVID-19, what is evident is that reflections must arrive at a point where critique about not only the 'what of knowledge and the curriculum', but also the 'how much' in terms of assessment and types of assessment in relation to the 'why is this appropriate' for this level of study (modalities; the first-year and final-year transitions being an additional foci of the NWU TL Strategy).

North-West University energies arising from COVID-19 needed thus to be distilled further in the form of a plan for digitalisation of education at the NWU which defines the time spent with students in terms of modalities appropriate to the pedagogic approach and curriculum outcomes of programmes offered by the university. In the context of prolonged uncertainty, adaptability as a disposition or trait characteristic of professional practice needs to be facilitated better for university staff, as well as students, in relation to technology adoption and confident use. Such adaptability includes access to resources and support, as already mentioned; it also entails a willingness to move away from conventional formalised decision-making and consulting processes to more open-ended, less formal,

wisdom-seeking meetings involving a cross-section of stakeholders in meetings in which the core business is discussed as well as planned for. Having described themes emerging from the experience of COVID-19 and a better focused and more reflexive experience of professional development of university staff, sections to follow further focus on the specific of the 'technological affordance' within the analogy of orbital and progressive wave movements.

■ The pedagogic proposition afforded by technology: The quality and evidence of engagement

The pedagogic implication for academic professional development is not necessarily a technology proposition in the first instance, in relation to improving the quality of teaching *per se*, as much as it is concerned with creating the possibility for engagement between teacher and students and between students and each other: attentive engagement and the pedagogies that enable it become most prized. Indeed, if considered from an education perspective, chapters elsewhere in this book illustrate competently the critical success factors enabling of large-scale, highly engaging modules for individual as well as group interaction. What emerges in these success-narratives is the importance of resilience development, connection between students even if working remotely, and the importance of professional support, which enables educationally sound design of the teaching-learning activities in ways such that the education technology could best support a variety of engagements (break-away virtual small groups, real-time chat-recording, group notes using perhaps Google Docs). Access to technology (in the form of design) for students and access to technical support for the academic staff (so as to enable them to interact and also monitor teaching-learning engagement) thus go hand in hand. From a student experience and learning perspective, there are doubtless definite advantages over in-person teaching in lectures, but creating opportunities for some variety of engagements and then being able to monitor these remains a challenge.

Amidst the crisis of COVID-19, and specifically in relation to technology and academic professional development, a key question to ask and answer is: to what extent can educational technology better enable engaged attention from the academic and improve engagement between students, as society attempts to move forward with COVID-19, rather than move beyond it? Pre-COVID-19 academic professional development attended to enhancing the performance of the academic as someone able and adept enough to manage the learning of large numbers of young adult learners not, for the most part, at the reading age adequate to either comprehend or synthesise the

complexities of curricular content. Teaching in these quantities has always been underpinned with concerns about the quality of learning (Pedder 2006) and the pedagogy used by teachers to ensure engagement.

In pre-COVID-19 times, the way in which universities have addressed the need for professional development is in relation to the complexities of managing large groups, but what if technology could be tailored not only in terms of enhancing the capacity of the academic to hold the attention of multitudes, but also in terms of being able to monitor engagement between students through increasingly nuanced learner and learning analytics? The scholarship concerning large group pedagogy reflects this: the challenge with large group teaching-learning has been dominated over the last 30 years by research concerning how to mitigate the risks of students becoming disaffected and disengaged, as well as the risk of losing the mass-lecture theatre. What is also revealing is the extent to which the uses of education technology as part of academic professional development have been motivated or promoted by the idea that technology assists the academic to achieve meaningful contact with students in the context of massified education. If true, this would address the most persistent complaints from both sides of the 'contact coin': from students about academics that seem unresponsive and inaccessible; from academics about students being disengaged and expecting to be 'spoon-fed'. Unthinking reversion to the old normal is an orbital wave movement to an educational approach that (even if it appears progressive thanks to the application of technology) is and was problematic.

Like the wave which appears to have an inevitable forward-moving momentum, with its swell and its cresting, there is also an uncomfortable possibility: that of reversion to the comforts of the old normal without taking stock in social, economic, and educational terms of the catastrophic nature of the old normal, only to find that the wave has not moved and instead orbits to reproduce the systemic inequalities which remain unaddressed in the aftermaths of the initial waves of COVID-19. This is not the minor concern only for educationists, for as Solnit (2020:1) notes, 'those who benefit most from the shattered status quo are often more focused on preserving or re-establishing it', a fact borne out in South African universities as shown by Jansen (2017) in his descriptions of race and other privileging still evident in South African HEIs. Universities can repair social inequality by contributing research and graduates to the economy, who in the work they find or the work they create can address inequality.

◼ Conclusion

In moving from a globalised account of crises and the ends to which these have been used in the late 20th century, this chapter expresses disquiet about

the educational and social responses to COVID-19 to date. This scepticism is expressed not only in relation to a globalised perspective in relation to the political, economic, and educational uses to which crisis has been used, but also in relation to a more contextualised account of inequality in a South Africa accustomed to widespread crises. COVID-19 risks exacerbating existing inequalities, vulnerabilities, and needs experienced both by students and staff. Connectivity might suggest inclusion, but it cannot be regarded as equivalent to such for either educators or learners in this context. Access to data and devices, whilst enabling at one level, cannot be regarded as equivalent to a participatory student experience. Four themes emerging from an understanding of the impact of COVID-19 are shown to be relevant in relation to the development of and support for academic and support staff of the university, and these coalesce as resilience, support, reconceptualisation of space and place, and a reconsideration of the value and purpose of conventional assessments in the context of students' actual contexts and the need for more authentic approaches that take account of both programmatic and geographic needs. Having considered the four themes, the chapter locates the applicability of these four themes within a particular illustration (the large lecture venue) of how thinking about technology affordances and educational opportunity oscillates in the period of a crisis between an unreflective reversion to the 'old normal' without acknowledging the inequalities which existed therein (not least of which is the digital divide: Kajee & Balfour 2011).

This overview allows the reader to understand better the link between society and education. There is needed now a fundamental shift from 'what I teach' to 'how I teach' and that is the focus on the professional development of academics on the one hand and the dedicated educational technology support on the other hand. Put simply, COVID-19 has galvanised progressive as well orbital practices and perspectives (on society, on education). The need for a dedicated scholarship of teaching and learning on how to take advantage of the progressive momentum associated with COVID-19, through the pedagogic examples developed over the last two years, is urgent to enable a cresting of the wave of change, rather than disappearance beneath it.

Chapter 2

Rhizomic development of the student excursion, across three faculties in a multi-campus university

Yolani Geldenhuys
Centre for Teaching and Learning, North-West University,
Potchefstroom, South Africa

Josef de Beer
Research Unit Self-Directed Learning,
Faculty of Education, North-West University,
Potchefstroom, South Africa

■ Abstract

In Chapter 1, Balfour utilised the analogy of a wave to describe the NWU's responsiveness to the COVID-19 pandemic. It was shown how such incidents of trauma could catapult social and educational change. In this chapter, we highlight one of the innovative responses of the NWU in addressing the challenges created by the pandemic, namely a first-year student excursion, utilising a virtual, online platform. We utilise the PPC Model of Hiemstra and Brockett (2012) to show how the context in which the virtual excursion took

place, and the processes (teaching-learning activities) could enhance the development of SDL attributes in students (the 'person' in the model). Furthermore, we contextualise the context element of the PPC model on a macro-level (within the teaching and learning framework of the NWU), meso-level (by referring to the three faculties – Education, Law and Health Sciences – involved in these excursions), and micro-level (the student's development, sense of belonging, and integration within the university). We furthermore describe how the excursion had a rhizomic development in terms of responding to current needs and curriculum imperatives, and how this rhizomic development had the impact of facilitating SDL and a sense of belonging in the three faculties.

■ Introduction

In this chapter, we use as a metaphor the biological construct of a rhizome, a modified plant stem that produces new shoots from its nodes. Rhizome, in the context of this chapter, means a place where new networks or connections may form, and metaphorically, it describes how student excursions have resulted in new faculties to come on board (taking root), but also shows how the traditional face-to-face excursions hosted by the Faculty of Education from 2016 to 2019 (not in 2020, because of COVID-19) transformed into virtual online events, in the context of the COVID-19 pandemic. The focus of the chapter is to contextualise the virtual excursions in support of the institutional (NWU) strategic goals (macro-level), the professional discipline and its needs and requirements (meso-level), and the personal development of the student (micro-level).

The successes and impact of the face-to-face excursions that the NWU Faculty of Education has engaged with since 2016 have resulted in funding from the Department of Higher Education and Training (DHET) through a UCDG to extend (rhizomic development) the excursions to two other faculties, namely the faculties of Health Sciences and Law. The reason for involving these two faculties is that they also prepare students – as we do in Education – for professions. Although the initial intent was to have face-to-face excursions, COVID-19 resulted in a decision for these excursions to become virtual events, as will be further explained in Chapter 3.

The first-year student excursion project serves to address some of the perennial challenges in the higher education sector as well as institutional-specific challenges. The excursions have a number of objectives:

1. To bring students and staff from all three campuses – Potchefstroom, Vanderbijlpark and Mahikeng – together in a virtual teaching and learning context, providing an enhanced 'sense of belonging' within a unitary structure for both students and staff.

2. To provide first-year students (who are often first-generation tertiary students) with more nuanced understandings of what the careers they are being trained to entail.
3. To emphasise the importance of self-directed learning (SDL) amongst first-year students.

In this chapter, the PPC model (Hiemstra & Brockett 2012) for SDL will be used as a theoretical framework to interrogate the contextual environment that intersects with the process and person aspects in the model. In this way, we will show through our analysis how the excursion as part of the learning context could support the enhancement of SDL.

■ Theoretical framework: The person-process-context model for self-directed learning

Hiemstra and Brockett (2012) hold the view that SDL can best be realised when three factors – the person, process, and context – are in balance. This balance would mean that (Hiemstra & Brockett 2012):

> [*T*]he learners are highly self-directed, the teaching-learning process is set up in a way that encourages learners to take control of their own learning, and the sociopolitical context and the learning environment support the climate for SDL. (p. 159)

Several authors in the SDL field are of the opinion that more emphasis should be placed on research into the role of context (Andruske 2000; Hiemstra & Brockett 2012). Merriam (2001) makes a strong argument that context should receive more emphasis in andragogy and SDL when she states that:

> Knowles's version of andragogy presents the individual learner as one who is autonomous, free and growth-oriented. Critics have pointed out that there is little or no acknowledgement that every person has been shaped by his or her culture and society, that every person has a history, and that social institutions and structures define, to a large extent, the learning transaction irrespective of the individual learner […] and even though Knowles promoted andragogy […], he never considered the organizational and social impediments to adult learning; he never painted the big picture. (p. 7)

Merriam continues by citing Grace (1996:386), who comments that Knowles 'chose the mechanistic over the meaningful […] (and) reduced the adult learner to a technically proficient droid, operating in a world where formulaic […] SDL mantras are the order of the day'. According to Nasri and Mansor (2016), the:

> PPC model postulates that SDL will be most effective when: (1) the learner is highly self-directed; (2) the instructional process encourages learners to take responsibility and control of their own learning, and (3) the socio-cultural context, as well as the learning environment, offer a conducive atmosphere for the development of SDL. (p. 2757)

The PPC model is illustrated in Figure 2.1. The three elements of the model can be summarised thus:

- **Person:** this includes characteristics of the individual, such as creativity, critical reflection, enthusiasm, life experience, life satisfaction, motivation, previous education, resilience, and self-concept (De Beer 2019:105; Hiemstra & Brockett 2012; cf. Nasri & Mansor 2016:2757).
- **Process:** this involves the teaching-learning transaction, including facilitation, learning skills, learning styles, planning, organising, evaluating abilities, teaching styles, and technological skills (De Beer 2019:105; Hiemstra & Brockett 2012).
- **Context:** this encompasses the environmental and sociopolitical climate, such as culture, power, learning environment, finances, gender, learning climate, organisational policies, political milieu, race, and sexual orientation (De Beer 2019:105; Hiemstra & Brockett 2012).

The PPC model holds the potential to guide future SDL research at the intersection between the personal and contextual elements (Hiemstra & Brockett 2012:159). Hiemstra and Brockett (2012) state that:

[O]ne of the most contested aspects of self-directed learning over the years has been that it focuses on the individual learner without considering the impact of the sociopolitical context in which such learning takes place. (p. 159)
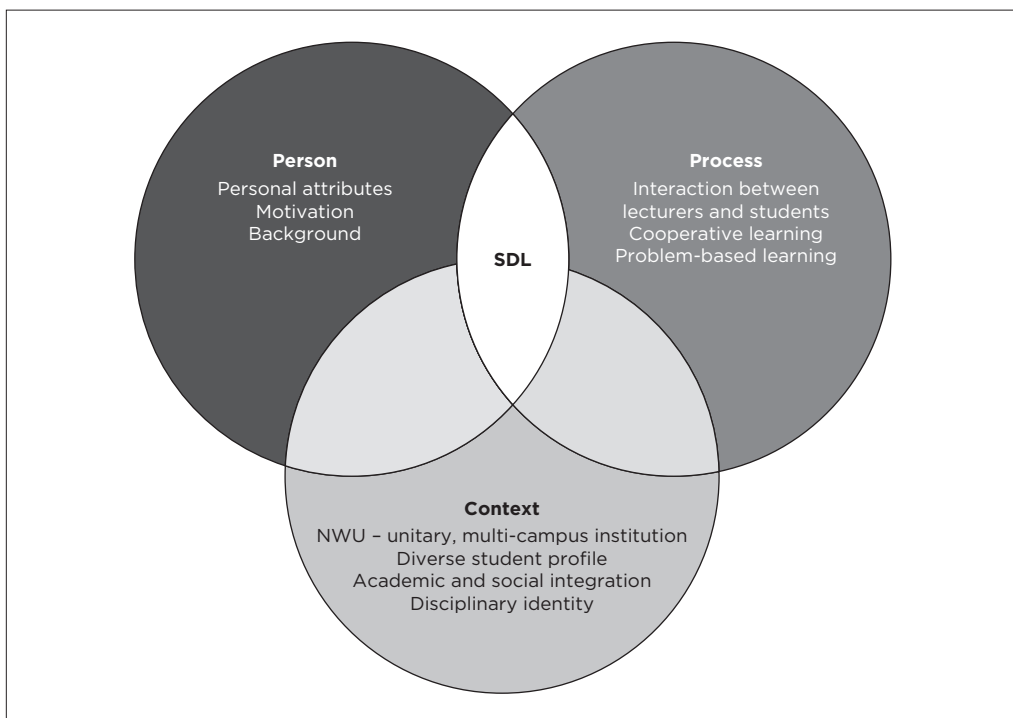
Source: Based on Hiemstra and Brockett (2012:158).
Key: SDL, self-directed learning; NWU, North-West University.
FIGURE 2.1: The person-process-context model.

There has been relatively little work at the intersection of these elements – an aspect also emphasised by Merriam (2001). Using the PPC model in this manner suggests that there are areas within SDL that have been virtually unexplored.

In this chapter, we aim to show the importance of an understanding of the sociopolitical and cultural environment in which learning takes place. We argue that the online, virtual excursion provides a learning context conducive to supporting SDL. We argue that if the contextual environment is well defined, understood, and transparent, the process of learning will be influenced, and the development of the person as self-directed learner will be enhanced.

Figure 2.2 portrays the multi-layered contextual environment which enhances SDL. In this chapter, we concentrate on each of these layers, connecting them with the virtual excursions. Teaching and learning activities on a virtual platform (micro-level) have been influenced by the specific disciplinary context of the three faculties (meso-level) as well as institutional policies and key strategic drivers of the NWU (macro-level).

The macro-level layer defines the institutional strategic intent. This environment urges us to consider how the strategic intent and drivers of the university should influence the virtual excursions. In other words, the

Multi-layered context wherein the virtual excursion takes place

Macro level
Institutional policies
Unitary, multi-campus structure

Meso level
Faculty level
Disciplinary identity
Sense of belonging

Micro level
Lecturer-student
engagement
Student-student
engagement
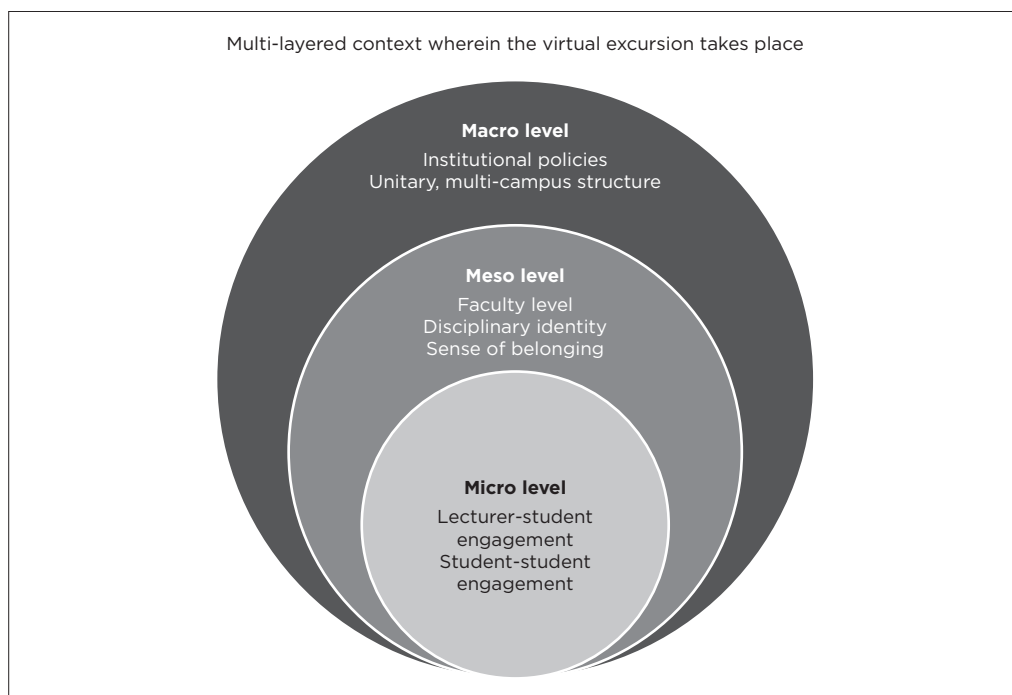
Source: Developed by Geldenhuys and De Beer (2021).
FIGURE 2.2: The various layers that define the context of the virtual excursions.

learning context in which the virtual excursions took place should be aligned with the NWU strategic intent and policy documents. The NWU is committed to social justice (hence inclusion, diversity awareness, and strategies to reduce inequalities), and these are pillars on which the excursion is built. The meso level represents the particular faculty, but more specifically the profession students are being prepared for. The virtual excursions in the three faculties (Education, Health Sciences, and Law) were purposefully selected for participation in this UCDG project. All three of these faculties deliver aligned professional academic qualifications on the three campuses. The excursion has been contextualised to provide students more nuanced understandings of what being a 'super-teacher', 'Health Hero', or 'super legal professional' entails. The micro level refers to the synchronous and asynchronous online learning environments where students interact with each other and academic staff.

Although the virtual excursions were executed somewhat differently in the faculties, the purpose and objectives of the excursions were comparable. The qualitative data collected from students will be used to emphasise how the virtual excursions were aligned with the various levels as well as indicate how the elements of the PPC model intersected to enhance the development of self-directed students.

Before we elucidate the three contexts and findings that emerged from the collected data, the researched methodology and ethics will be discussed.

■ Research methodology and ethics

This section provides detail on the ethical permission obtained from the NWU and the gatekeeper (NWU registrar), which will therefore not be expounded on in the other chapters. Ethical clearance was obtained for researching the Faculty of Education's face-to-face excursions in 2017 (NWU-00487-17-S2). As the virtual excursions were implemented in 2021, they necessitated new research instruments and secondly involved two additional NWU faculties, and we had to apply for new ethical clearance, which was provided (NWU-01013-21-A2). As NWU students were involved in the research, permission also had to be obtained from the NWU gatekeeper and such permission was given (NWU-GK-21-065).

All first-year Bachelor of Education (BEd) students in the Faculty of Education had to participate in the virtual excursions. However, in the letter of consent provided to them, it was made clear that participation in the research related to the excursion was voluntary and that they could withdraw from the study at any time. They were also assured of their anonymity. In this chapter, we refer to students as such (utilising three identifiers): BEd student; gender unknown; date of data collection.

■ Research design

In the Faculty of Education, a total of 1 069 students provided consent to participate in the excursion. Health Sciences implemented a pilot project in which 55 students provided consent to participate in the research project.

This design-based research (DBR) utilised a mixed methods approach. Plomp and Nieveen (eds. 2010) describe DBR as:

> [*T*]he systematic study of designing, developing and evaluating educational interventions as solutions for complex problems in educational practice, which also aims at advancing our knowledge about the characteristics of these interventions and the processes of designing and developing them. (p. 13)

Since 2017, the NWU has researched the excursion as an intervention in the Faculty of Education, and based on the annual findings, new design principles were developed, and the excursions came to be adapted as needed and then also piloted in two other faculties, as noted earlier.

The quantitative component of the research includes the self-directed learning instrument (SDLI) of Cheng et al. (2010), as well as various opinion polls that students completed during the online excursions (in ch. 5, the SDLI instrument will be explained in more detail, as well as its analysis). Qualitative data include comments by students in the 'chat box' function of Zoom during the virtual excursion, their responses to an open-ended questionnaire, and interviews with staff and student facilitators. In Chapter 10, the e-posters that students compiled as the assessment component of the Education excursion will also be used as a source of qualitative data. The qualitative data were analysed using Saldaña's (2009) coding system, where codes were identified and categories established, from which several emerging themes were identified.

In this chapter, we will use students' responses from the open-ended questionnaire to support the discussions of the various layers in which the virtual excursions took place, as demonstrated in Figure 2.2. We then identified four themes that emerged from the data aligned with the discussions in this chapter, namely addressing the macro, meso, and micro levels of the context element of the PPC model.

■ The macro-level context: The North-West University shape and size

The NWU is one of 13 traditional universities in South Africa. The NWU officially came into being on 01 January 2004 as part of an institutional merger. The series of university mergers was aimed at overcoming the apartheid-induced divide between historically white and historically black universities. In the case

of NWU, the Potchefstroom University for Christian Higher Education (PU for CHE) with predominantly white Afrikaans students, the University of the North-West, and Vista Sebokeng campus with mostly black students from rural communities merged to become one university called the NWU with three campuses geographically distant from each other, namely the Potchefstroom Campus, Mahikeng Campus, and Vanderbijlpark Campus (Prinsloo 2016). The initial perceptions of this merger are well described by Pretorius (2017:14) of 'Big brother Potch and little brother Mahikeng', and 'us and them'. Since the merger, the leadership of the NWU has gone to great lengths to align resources, structures, and academic qualifications and establish an institutional culture recognising the unique context of each campus. As Pretorius (2017:259) states, transformation had to maintain a prominent position in the institutional plan. In 2016, the NWU has implemented its eight-faculty multi-campus unitary management model with a strategic intention 'to transform and position the NWU as a unitary institution of superior academic excellence, with a commitment to social justice' (NWU TL Strategy 2020a:10).

With a total of 56 425 enrolled students in 2020, the NWU is currently the second-largest university in South Africa. Of the enrolled students at NWU, 64% are African, 30% are white, 4% are coloured, and 1% Indian or Asian, whilst 44 785 of them are contact students and 11 640 are distance education students (NWU 2020b).

The NWU offers students more than 400 individual degree qualification study choices at undergraduate and postgraduate levels – ranging from agriculture and the arts through to commerce, engineering, education, health, law, the natural sciences, and theology. Many of these faculties offer qualifications in distance and contact mode of delivery. Similar qualifications offered on three campuses need to be aligned. Aligned qualifications suggest students across campuses and modes of delivery have a similar quality of educational experience and the best possible opportunity to succeed.

In light of the above and for the purposes of this chapter, it is significant to note that the overarching environment influencing the context of the virtual excursion is the institutional policies and strategic goals of the institution. This is what we refer to as alignment at the macro level. Having a clear understanding of the macro environment and what the institution values will support a meaningful and purposeful designed learning experience. The discussion that follows highlights some of the key elements in the NWU Teaching and Learning Strategy that influence the design of the virtual excursion.

■ Access with success

Amongst others, one of the key strategic drivers of the university is to provide improved access, retention, and student success in order for the NWU to respond effectively to the challenges facing South African higher education

as a system characterised by low participation and high attrition rates (NWU TL Strategy 2020a:6).

According to a national survey, the Beginning University Student Survey administered by the University of the Free State, about 75% of first-year students that enter HEIs are first-generation students (ed. Strydom 2017). First-generation refers to a student who is the first in their immediate family to graduate from university. This number is increasing yearly and across racial lines, and it indicates the changes in student profile over the past 10 years. According to the findings in 'Engaging students: Using evidence to promote student success' (ed. Strydom 2017), first-generation students do have the motivation to succeed but they are at risk because of a lack of role models in their close family.

Knowing who our students are and recognising that many of our students might have difficulties transitioning and persisting in the first year are important considerations to ensure better integration in the university environment. Van Zyl (2010) suggests that HEIs should provide purposeful interventions for first-year students to adapt to new ways of doing in an institution.

The NWU has various structures in place to induct students into the university environment, such as the first-year experience (FYE) systems for testing their levels of academic and e-learning literacy, the provision of guidance on placement within academic programmes, and programmes and facilities for the development of academic literacy, including competencies in reading, writing, mathematical and numeracy skills, critical thinking skills, and an ability to engage with appropriate information technology (NWU TL Strategy 2020a:13).

These interventions relate closely with the ideas of Tinto's (1987) model that suggests 'that academic and social integration is essential to student retention'. Academic integration includes intellectual needs whilst social integration is concerned with meaningful relationships with faculty and other students (Tinto 1987). The design and execution of the virtual excursions within the three faculties are examples of supporting students with integration in the institution. Academic integration is addressed by designing the learning experiences in the virtual excursion in such a way that students are introduced to the 'way of learning and doing in higher education'. Socially, students have an opportunity to network with students across campuses and meet and interact with peers during the excursions. They also get to engage with staff (lecturers) in a more informal context than the traditional lecture hall. This, we claim, could assist students with their social and academic integration into the university environment and possibly enhance academic success. This remains a challenge of course in a multi-campus context, as will be explained in the section 'A unitary institution'.

■ A unitary institution

As explained in the NWU shape and size section, the NWU offers academic qualifications and programmes in an aligned manner. This implies that students can study the same qualification on the campus of their choice. In the past few years, effort was made to ensure that the institution functioned as a unitary institution. However, most of the emphasis was on structures, management processes, and curricula. Because of the distances between the NWU campuses (e.g. there is a distance of 200 km between the Potchefstroom and Mahikeng campuses) as well as the isolation of students studying in the distance mode of delivery, students often do not get the opportunity to interact with each other and get a sense of belonging amongst students in the same profession and in the same university. The NWU TL Strategy urges faculties to create 'platforms for students to exchange discipline-specific knowledge and competencies across campuses' (NWU TL Strategy 2020a:9). The virtual excursions support this statement as it has the objective to bring students and staff from all three campuses – Potchefstroom, Vanderbijlpark and Mahikeng – together in a teaching and learning context, providing an enhanced 'sense of belonging' within a unitary structure for both students and staff. The objective of bringing students from the three environments together is purposefully designed to provide students with an opportunity for social integration, in terms of the Tinto model (Tinto 1987). A student's sense of belonging has been described as the cornerstone of successful retention (De Beer 2006:38). Various terms such as 'sense of community' (Harris 2006:85), 'student-institution-fit' (Heverly 1999:3), and sense of belonging (Hausman, Schofield & Woods 2007:829) have been used to describe student social integration.

As will be explained in Chapter 3, the face-to-face excursions brought students in direct contact with each other, and they could engage with students from other campuses. In the virtual space, this objective was just as important, and the academic staff used quotas during the registration process for excursions to ensure equal representation from the three campuses. The data collected after the excursion confirms that students mostly see the institution as unitary but also often express an identity as a student at a specific campus.

The following responses are examples of the students' sense of belonging and acknowledging the NWU as a unitary institution. Question 7 in the open-ended questionnaire prompted students to reflect on the following question, 'What are your experiences of the NWU, and do you see yourself as an NWU student, or a Potchefstroom/Mahikeng/Vanderbijlpark campus student?' The first theme that emerges from considering the macro-environment, relates to students' sense of belonging at the university.

▪ Theme 1: The virtual excursion assisted in enhancing a sense of belonging in students

Several students commented on how they felt 'united' as prospective teachers during the virtual excursion. For example, Respondent 27 commented that:

'I see myself as an NWU student because we all unite as one.' (BEd student, gender unknown, 07 October 2021)

This sense of being united was also echoed by other students, and Respondent 28 utilised the metaphor of a family:

'To be honest, there are times where I forget that I'm from the VT Campus because NWU students from different campuses are one big family.' (BEd student, gender unknown, 07 October 2021)

One insight noticed during the data analysis was that the excursion especially provided a sense of belonging amongst the open and distance learning (ODL) students. These students have less access to the NWU campuses and other students, and Respondent 26 commented:

'I am a distance student, so I see myself as a NWU student, as I do not associate myself with any or one campus, as I do my learning from home.' (BEd student, gender unknown, 07 October 2021)

However, this student further indicated that:

'I loved the fact that I could work with my peers during the virtual excursion. It was such an intense and stimulating experience. I felt like a real student.' (BEd student, gender unknown, 07 October 2021)

Croft, Dalton and Grant (2015) highlight that ODL students often experience feelings of isolation because of the physical and temporal separation of facilitator of students, and between students themselves. The virtual excursion, because of the synchronous nature of it, provided ODL students the opportunity to engage with both lecturers and fellow students on the contact campuses, and this brought in the 'human dimension' that Croft et al. (2015:52) show is often lacking in ODL contexts.

The data also speak of students feeling proud to be associated with the NWU brand. Respondent 31 stated:

'I see myself as a Mahikeng Campus student as well as an NWU student. It feels great to be part of such a big and respected university. It makes me proud to say I am an NWU student.' (BEd student, gender unknown, 07 October 2021)

Similar responses were given by other students (e.g. Respondent 41). The sad reality of COVID-19 is emphasised in the following student response:

'Personally, I have not had a full NWU student experience besides from online work and virtual classes (rarely). I think I'm going to enjoy being an NWU student, but for now, I haven't really felt I am one yet. I think the shock of it hasn't set in yet. However, I do see myself as a student of the NWU Potchefstroom campus, as that is the only campus I interact with. The virtual excursion did give me a chance to work

with students from different campuses, and I did only see us as NWU students, but I cannot help but identify with the campus I am registered to.' (BEd student, gender unknown, 07 October 2021)

The above responses show the value of these virtual excursions in developing an NWU identity in the context of the pandemic.

☐ Diversity and inclusiveness

The NWU TL Strategy (2020a) referred to earlier clearly states that:

> Recognising that NWU students have diverse social and educational backgrounds, learning needs and expectations, the University acknowledges its responsibility to provide students with a responsive, accessible and supportive learning experience which will empower them to progressively assume greater responsibility for their own learning. The learning experiences are designed to enable students to provide a reasoned account for their own beliefs, practices and attitudes and to challenge embedded social constructs and beliefs. The NWU approach echoes and advocates the National Qualification Framework's demand for a progressive increase in student learning autonomy and self-accountability at different qualification levels, and from the first to the final year of study. (p. 13)

From the above statement, the NWU values sociocultural diversity and recognise that students are coming from various and diverse backgrounds. It suggests a commitment to provide students with opportunities to actively engage in educational practices that will create self-agency in learning as well as develop personal qualities that will enable them to contribute constructively to professional, public, and personal lives. Research done on the excursion presented by the Faculty of Education indicates that students often hold stereotypes of 'others' – often along racial lines (Petersen & De Beer 2019), which corrodes a 'sense of belonging' in a unitary institution. Furthermore, a large body of research affirms that first-year students often hold naïve understandings of (1) the demands of tertiary studies and (2) the world of work that they are being prepared for (De Beer & Gravett 2016; De Beer, Petersen & Dunbar-Krige 2012; Gravett et al. 2017). In light thereof, the university leadership encourages faculties to create spaces or projects that nurture a sense of unity amongst our staff and students by means of engaging with peers on other campuses and across modes of delivery.

Another objective of the virtual excursions is to sensitise students about inclusion and the 'othering' of people. The design of the excursions explicitly addresses this objective by means of activities such as the 'Famine and Abundance' game (cf. ch. 9 for an in-depth discussion). During the excursions in all three faculties, a student's own beliefs and values are being challenged. The data confirm that students acknowledge views divergent and different from their own and that they learn to value these parts of the experience of the excursions. Their engagement with students from different races, religions, worldviews, or sexual orientations provide the 'tensions' (or *dramatical collisions*,

in Veresov's [2004] parlance) explained in Chapter 3 to critically reflect on issues of inclusivity, social justice, and personal biases that they might hold.

The next theme addresses the excursion as a context for scaffolding learning about social justice and inclusion.

▪ Theme 2: The virtual excursions provided students with more nuanced understandings of social justice issues, inclusion, not 'othering' of people, and jointly constructing knowledge

As will be explained in Chapter 3, the excursion is built on social constructivist principles, where students jointly construct meaning. Education students commented on how they enjoyed working in a cooperative learning fashion in the break-away rooms during the virtual excursions:

'Interacting with different people is fun and interesting.' (BEd student, gender unknown, 07 October 2021)

This response was shared by many other students, amongst them Respondent 16, who appreciated the cultural diversity in the groups:

'I experienced to work with other people from different cultures and I enjoyed it.' (BEd student, gender unknown, 07 October 2021)

Similar sentiments were expressed by Respondents 27, 30, 51, and 52. Respondent 52 also highlighted how cooperative learning provided more nuanced views of teaching as a career:

'I found the virtual excursion to be insightful. I learned a lot from my fellow peers, and I had the opportunity to view education as a career from many different viewpoints.' (BEd student, gender unknown, 07 October 2021)

Respondent 58 had the following to say:

'I truly enjoyed all the lessons; it was an eye-opener, showing the importance of teamwork, as at times you might think you are right; however, when you hear what others are saying about the same topic, you then realise that [*you should*] never conclude on a matter until you have heard others people's opinion.' (BEd student, gender unknown, 07 October 2021)

Students also commented on how they explored new strategies for learning in their small groups:

'The excursion is the best way to learn how to participate with others or even learn new strategies of learning.' (BEd student, gender unknown, 07 October 2021)

Very similar feedback was received from Health Sciences students. Respondents 1 and 2 emphasised how the virtual excursion stimulated critical reflection:

'This project has allowed me to reflect on my own values as well as learn new values from others.' (HS student, gender unknown, 14 October 2021)

'I learned from so many other students what their view is on who and what a Health Hero should be; it was very interactive, and the fact that we were able to work in groups with students across the campuses as well as fields of study made it that much better to take everyone's opinions and beliefs into consideration — which is sometimes difficult when working online, but [*it*] is made into a fun and motivational experience for many of us!' (HS student, gender unknown, 14 October 2021)

Students in both faculties (Education and Health Sciences) acknowledged the fact that the excursion provided a 'stage' (cf. ch. 3, the section on Vygotsky's [1978] social constructivism) on which they could socially construct knowledge and learn from one another. This Vygotskyan stage, to use the metaphor of De Beer and Henning (2011), provides an opportunity for students to consider their own biases and learn about social justice and inclusivity.

The values in the macro-level environment influenced the learning design, and we argue that having a clear understanding of these institutional values provides a more holistic, systemic, and empowering learning opportunity for students. The section 'The meso level – professional or disciplinary identity' will focus on the meso-level context, and how the excursion addressed it.

☐ The meso level – professional or disciplinary identity

The second level, the meso-level contextual perspective, refers to professional identity within the disciplinary context. Some academic qualifications situated within faculties are recognised as professional degrees and are aligned with specific and recognised professional bodies in the world of work. Academic programmes in the Faculties of Education, Health Sciences, and Law are recognised as professional qualifications. Each of these faculties has its own unique disciplinary context and aims to develop the student to either become, for example, a foundation phase teacher, a nurse, or a lawyer. The professional or disciplinary identity is an extremely important aspect in designing professional qualification courses. However, in South Africa, students often do not have a clear comprehension of the world of work or the professional they will become. Students in the Faculty of Education received formal education from teachers over a period of 12 years or more. Thus, by the apprenticeship of observation (cf. ch. 5), they only have a skewed lived experience of the profession. In the faculties of Law and Health Sciences, these careers are not necessarily modelled to students, who often have twisted ideas of what their profession entails – often fuelled by the glamorous portrayals of these careers in movies or on television. A more detailed description of professional identity can be found in Chapter 12 (Law) and Chapter 13 (Health Sciences). The leitmotiv for the Education excursion was 'becoming a super-teacher', and the excursion context was conceptualised around sensitising students towards what it means to be a 'super-teacher' and to set individual learning goals as self-directed learners to become such 'super-teachers'.

In the context element of the PPC model, an understanding of this professional context (as a meso-level contextual consideration) is integral in the design of the virtual excursions. All three faculties had an objective to expose students to the discourses of the discipline, the professional identity, and the values and characteristics of such a professional – respectively becoming a 'super-teacher', 'health practitioner super-hero' or 'super legal professional'. The excursion was purposefully designed to challenge existing ideas and allow students to express their opinions about what they experience.

Although the virtual excursions were coordinated and implemented on the faculty level, all stakeholders within faculties were members of a UCDG Committee, which ensured alignment to common goals and vision statement. For the Faculty of Education, these virtual excursions form part of the formal curriculum in the first year (BEd qualification) whereas, in the Faculty of Health Sciences and Law, these excursions were facilitated for the first time in 2021, and it was not compulsory for students to participate. For these two faculties, the excursions are still part of a pilot project. With great success already in the first year of the pilot for the Law and Health Sciences, respectively, these excursions will develop and gain momentum. Taljaard (2018:235) suggests that an excursion should not be a 'stand-alone' activity. It should preferably be an integral part of a practical expansion of the formal classroom curriculum. These two faculties will therefore have to consider the alignment of the excursions with the registered qualifications.

On the meso level, it is imperative to consider, 'how do the virtual excursions facilitate epistemological access?' Epistemological access, as understood by Morrow (2009), has been defined as distinct from formal access. Epistemological access refers to access to disciplinary knowledge and norms, whereas formal access refers to students gaining access to study at a university.

Providing students with formal access without epistemological access is an empty promise and denies students social justice. Morrow (2009) defines epistemological access in the following manner:

> Epistemological access is not a product that could be bought or sold, given to someone or stolen; nor is it some kind of natural growth, such as the growth of plants or bodies. Epistemological access cannot be supplied or 'delivered' or 'done' to the learner; nor can it be 'automatically' transmitted to those who pay their fees, or even to those who also collect the handouts and attend classes regularly. The reason for this is that epistemological access is learning how to become a successful participant in an academic practice. In the same way in which no one else can do my running for me, no one else can do my learning for me. (p. 78)

Boughey and Niven (2012) emphasise that HEIs need to develop and embrace academic practices that would facilitate epistemological access. The excursions, we claim, provide an innovative approach to enhance epistemological access, as it enables students to (amongst other things) focus

on what is expected from them to succeed in their chosen qualifications (and future professions), develop as self-directed learners, and develop professional relationships with their lecturers (De Beer et al. 2012) that could also assist them in their sense of belonging and academic progress. Morrow (2009:37) states that educational programmes should embrace pedagogical practices that would induct students into the grammar, procedures, rules, and logic of the specialist discipline. Students should understand the discourse of the discipline and should develop nuanced understandings of the complexity of the profession. Most importantly, they should develop identities as competent teachers, legal practitioners, or health care workers.

Mingo (2013:11) emphasises the role of 'first-hand, real-life experiences', and we believe that the virtual excursions create such authentic learning environments. For example, in the case of Education, students needed to provide advice to the newly appointed principal of a dysfunctional school on how the school could be transformed to be a conducive learning environment. In the Faculty of Health Sciences, first-year students had to identify characteristics that should be evident in a professional health care practitioner after engaging with scenarios, and students had to reflect on their own values and behaviours as health profession students. The Faculty of Law also included law practitioners that shared their experiences during the virtual excursions, as one of the strategies used. In both, the faculties of Education and Health Sciences students responded that they have learned about their profession, the values, and the process of becoming a professional. The following responses support this statement.

◼ Theme 3: The virtual excursions enhance epistemological access and build professional identities in students

The following data affirm that students gained epistemological access through the virtual excursions and that they developed better understandings of the chosen profession:

> 'The virtual excursion was a life-changing excursion, I would say; I learnt more about the teacher I am becoming and [*whom*] I want to become. As much as I wished and prayed that it could have been a face-to-face excursion, I enjoyed every little bit of the excursion. It was indeed not a time-waster, and I so wish that whatever I learnt from the excursion happens around me so that I can be a super-teacher with super solutions.' (BEd student, gender unknown, 07 October 2021)

Several other BEd students (Respondents 3, 44 and 52) echoed this sentiment. Respondent 44 realised that she had a naïve view of the complexity of teaching:

> 'My overall experience, I would say, was intriguing because it showed me that there is more to a teacher than what I thought. I now know that a teacher is not only the

person who just writes on the chalkboard and explains, but rather the person that goes an extra mile in order to ensure the success of the learners. The excursion was an eye-opener, and it really made the love of teaching to really escalate and to be eager than never before.' (BEd student, female, 07 October 2021)

Respondent 12 also came to a similar realisation as the previous student:

'The excursion taught me quite a bit about my career as a teacher. I now know and realise that teaching is not as simple as it seems; however, despite all the challenges I will face, I am in the most rewarding career possible. For example, learning about abundance and famine has taught me how to make all learners feel inclusive and that I should never judge a learner before I know their background and situation.' (BEd student, gender unknown, 07 October 2021)

In Chapter 5, evidence is provided that the excursion provides students with a more nuanced understanding of their chosen professions. We argue that this realisation of being ill-prepared for the profession sets the table for SDL, as students have to set individual learning goals for themselves.

'It (the excursion) made me realise that my course has hardly begun and that hard work is ahead of me. I still have so much to learn to be a teacher, and I know teaching is no joke. It is a serious profession, unlike others say, and that teaching is the most difficult but rewarding profession. It made me realise what really goes into teaching. That it was not only what I saw as a pupil in class. It made me understand that as a teacher, you do not only teach. A teacher is a parent, a guardian, a career, a nurse, a therapist, etc. It made me realise that teachers are the hardest workers who do not receive all the well-deserved credit as they work almost behind the scenes. Teachers teach the future generation.' (BEd student, gender unknown, 07 October 2021)

The same realisation of the complexity of the profession was voiced by the following respondent:

'I found that my career choice is much more complex than I initially thought it to be. I am dealing with the future on a daily basis. Whatever I say or do, I have to consider carefully, as the consequences of my actions can have a major impact on my students' lives and thus their future in general.' (BEd student, gender unknown, 07 October 2021)

Similar data were collected in the Faculty of Health Sciences. The data show that the excursion stimulated self-reflection, as can be seen in the following response:

'I have learnt that being in health is not all about salary and that you are not only dealing with physical things, but also emotions. This project has allowed me to reflect on my own values as well as learn new values from others. I learnt from so many other students what their view is on who and what a Health Hero should be, learn more about traits and characters.' (HS student, female, 16 September 2021)

It appears that the meso context created during the excursion assisted students to develop better understanding of the complexity of the professions that they have chosen and enhanced their opportunity to gain epistemological access to their profession by means of an 'epistemological experience'. The key to this is to allow students to set individual learning goals for themselves.

☐ Providing context on the micro level

On the micro contextual level, we reflect on the virtual environment in which the actual engagement during the excursions occurred. It defines the pedagogical choices made for students to learn and develop SDL skills.

The NWU TL Strategy advocates to 'support its students so that they can progressively become self-directed and lifelong learners who make responsible, ethical, and distinctive contributions to society and the world of work' (NWU TL Strategy 2020a:10).

In the chapters that follow, the teaching and learning strategies utilised in the virtual environment will be explained in detail. These include a pedagogy of play, for example, where students engaged in the learning task as *Homo ludens* [the playing human] (Huizinga 1955). A problem-based learning approach, where students had to solve an ill-structured problem (cf. ch. 7), was also followed, as several researchers (Barrows 1984; Loyens, Magda & Rikers 2008) have shown that it could enhance SDL. Learning took place in a cooperative fashion, taking cognisance of the elements of cooperative learning, such as positive interdependence, individual accountability, face-to-face promotive interaction, interpersonal and small-group skills, and group processing (Johnson & Johnson 2008) (cf. ch. 8).

It is of crucial importance that teachers, law practitioners, and health care workers have integrated knowledge and critical understanding regarding social justice issues. During the excursion, gamification was used to address this aspect (cf. ch. 9).

The excursion provides a good context for implementing innovative pedagogical choices. The pedagogical choices made for the virtual excursion on the micro level, according to the student's responses below, resulted in students enhancing their SDL skills as well as academic skills required to learn in higher education.

■ Theme 4: The engaging pedagogies used in the micro context of the excursion created a conducive learning environment

The data portray that a well-contextualised excursion programme enabled the achievement of learning outcomes such as the fostering of SDL and critical reflection. Several students commented on the utilisation of problem-based learning (PBL) and cooperative learning (CL) during the virtual excursions:

'Working in teams and finding solutions to the problems facing us was great.' (BEd student, gender unknown, 07 October 2021)

'The excursion is the best way to learn how to participate with others or even learn new strategies of learning.' (BEd student, female, 07 October 2021)

Respondent 43 commented on her positive experience with CL:

> 'The virtual excursion enabled good teamwork and cooperative learning by effectively working with students who are ahead in their years of study. It was a great exposure to work and share ideas with others.' (BEd student, female, 07 October 2021)

From the data, it is also clear that good facilitation and scaffolding are essential. Respondent 32 made the following comment that was echoed by other students as well:

> 'I have learned a lot more than I thought I knew about teaching. I found it very interesting and engaging. Although it was 4 hours a day, the professors kept it interesting, and I enjoyed meeting new people in my group and breakroom. Overall, it was a fun and new experience that I will never forget and am proud to be a part of.' (BEd student, gender unknown, 07 October 2021)

■ Discussion of the intersections in the person-process-context model and self-directed learning

The chapter has demonstrated that the PPC model influences the development of SDL. The excursion creates a context that aids a sense of belonging, learning about social justice issues, enhancing epistemological access, and creating a conducive learning environment through its engaging pedagogies.

In Figure 2.3, we have added descriptions according to our findings in the intersections between the context and process and context and person. From the responses of our students and the objectives of the virtual excursions, we conclude that if the context on the various levels is understood and aligned, a conducive learning environment will exist (De Beer 2019). The overlapping of the person with the context will instil not only a sense of belonging to the institution, but also a nuanced understanding of the profession for which they are being prepared.

■ Recommendations

We would like to conclude with a few recommendations:

1. **The excursion should be part of the qualification offering and aligned to other modules:** In Chapter 10, it is shown how the e-posters were assessed in the Faculty of Education. This faculty made the excursion compulsory for students and ensured alignment with the rest of the modules as part of the BEd qualification. Taljaard (2018:235) commented that the excursion should not be a 'stand-alone' activity. The excursion should be an integral part of a practical expansion of the formal classroom curriculum. Thus, the faculties of Law and Health Sciences should explore how the excursion could be better aligned with the programme.
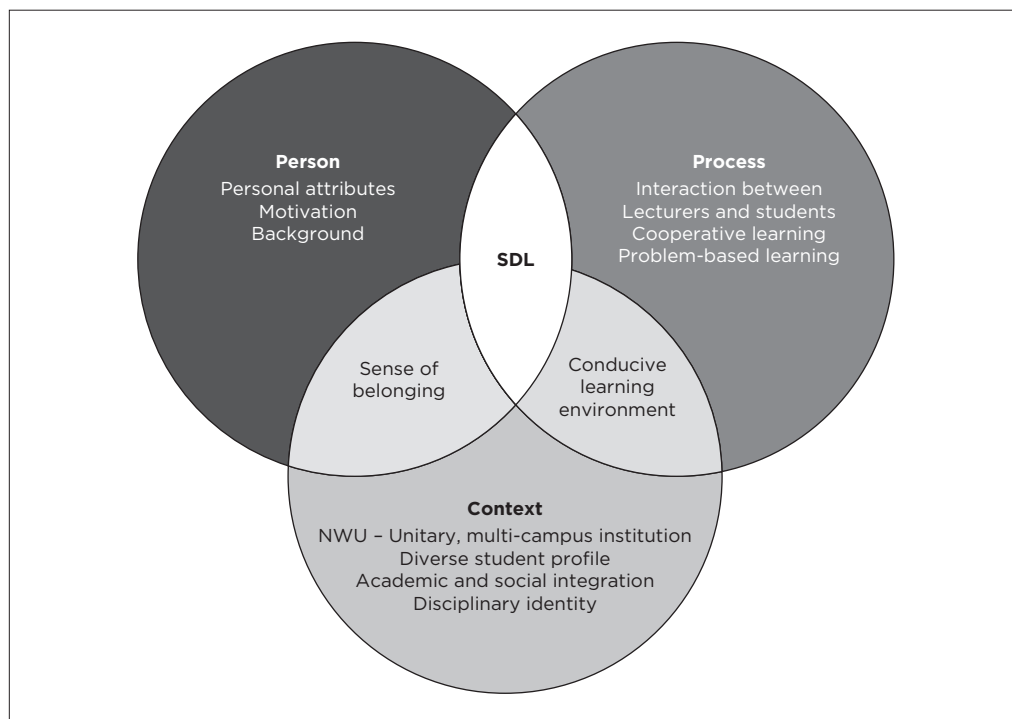
Key: SDL, self-directed learning; NWU, North-West University.
Note: It will be shown that there were statistically significant improvements in all four domains in the self-directed learning instrument of Cheng et al. (2010).
FIGURE 2.3: How the virtual excursion enhanced self-directed learning. Quantitative data showing students' SDL gains will be discussed in Chapter 5.

2. **Exploring opportunities to extend the excursion to other NWU faculties as well:** Given the fact that the virtual excursion has provided the institution a blueprint and opportunity for innovation to further instil the values of the institution of being a unitary multi-campus institution, and given that the data (cf. ch. 5) show its affordances in enhancing SDL, it might be beneficial to expand this to other faculties as well. One of the rhizomic developments planned for the immediate future is joint Education–Law–Health Sciences excursions, as the UCDG Committee have realised that there are many shared tenets that could enhance the learning of students in a more interdisciplinary context.

◼ Conclusion

The virtual excursions have resulted in statistically meaningful enhancement of SDL (cf. ch. 5). The success of the excursion lies in the synergy between

utilising cooperative- and problem-based learning principles and the 'withitness' of the facilitators (cf. ch. 11) in this synchronous learning environment. This is something that HEIs should explore, as it holds affordances to enhance SDL in students.

In conclusion, virtual excursions create a context that enhances SDL.[2] By considering the macro, meso, and micro dimensions of context, interventions such as the virtual excursion could be successful in enhancing SDL and promoting social and academic integration within the institution.

2. The empirical data in Chapter 5 clearly shows enhanced SDL after the excursion.

The affordances of face-to-face student excursions and implications for migration to virtual excursions

Josef de Beer
Research Unit Self-Directed Learning,
Faculty of Education, North-West University,
Potchefstroom, South Africa

Neal Petersen
Research Unit Self-Directed Learning,
Faculty of Education, North-West University,
Potchefstroom, South Africa

■ Abstract

This chapter interrogates social constructivism as the theoretical framework underpinning the student excursions. It is shown that the understanding by Western scholars of the two categories (namely learning on the interpsychological and intrapsychological levels) could be seen as a 'hidden dimension' (Veresov 2004) of Vygotsky's work. The origin of 'categories', as

described by Vygotsky, is traced back to prerevolutionary Russian theatre, and it is shown that it meant 'a dramatic event, collision of the characters on stage'. Such collisions could be a strong driver for effective learning and should be explored in the context of both face-to-face and face-to-screen learning environments. The chapter describes the rhizomic development of the excursion into a virtual online intervention and considers the design principles for such virtual excursions. The chapter concludes with a bird's-eye view of the main research findings, which are unpacked in detail in other chapters of the book.

■ Introduction

Since 2007, research has been done on the value of excursions for first-year student teachers in South Africa. What started off as an initiative of the Faculty of Education of the University of Johannesburg migrated to NWU, and from 2016, NWU has been engaging in excursions as well. Schön (1987) advocated for a 'low-risk setting for novice learning', and research over the past 15 years on student excursions shows that such a low-risk setting for preservice teachers' learning is provided by the excursion. Low-risk settings or safe spaces for students were created in a number of ways such as prioritising relationships, encouraging creativity as a means of self-expression, creating a warm and inviting space, and incorporating self-reflection and mindfulness during the excursions (LaHayne 2019). In our view, the excursion complements the work-integrated learning (WIL) of student teachers, which could be described as learning *in* practice. During the excursion, with its focus on case studies, students get the opportunity to also learn *from* practice. However, the excursion is a safe, low-risk setting for novice learning, as – contrasted with school experience or what is commonly referred to as WIL engagement – there are no school learners present. In this safe, low-risk learning space, student teachers are immersed in a context where they are placed in a zone of discomfort, as they are challenged with different (often marginal) worldviews to their own, unknown cultural customs, and social justice issues (De Beer, Van der Walt & Bunt 2020). Later in this chapter, we will justify this from a Vygotskyan social constructivist perspective.

Wenger (2003) explained that teaching, like medicine, has a culture, and this dictates that people who engage with it (teachers) all have shared practices, which develop an occupational identity. As Lampert (2010) states:

> Learning the practice of teaching is not only about learning to do what teachers do but learning to call oneself a teacher and to believe in what teachers believe in. (p. 29)

Lave (1993) emphasised that:

> Developing an identity as a member of a community and becoming knowledgeably skillful are part of the same process, with the former motivating, shaping, and giving meaning to the latter, which it subsumes. (p. 65)

The leitmotiv of the Education excursion for first-year students is to create a learning context where student teachers would reflect on what it means to become a teacher, and for this reason, the construct of a 'super-teacher' is utilised as a vehicle. During the face-to-face excursions, for example, all students received T-shirts with such a 'super-teacher' motive – refer to Figure 3.1. In this context, students then need to set individualised learning goals for themselves as self-directed learners striving to become 'super-teachers'.

The first-year student excursion could be viewed as a high-leverage practice in advancing student learning. Ball et al. (2009) define such high-leverage practices as:

> Teaching practices in which the proficient enactment by a teacher is likely to lead to comparatively large advances in student learning. High-leverage practices are those that, when done well, give teachers a lot of capacity in their work. (p. 460)

De Beer, Petersen, and Dunbar-Krige (2012) highlight several advantages of face-to-face student excursions, such as improved student–lecturer relationships, students developing the ability to negotiate rules in culturally diverse groupings, developing sensitivity to cultural diversity, and exploring

Source: Photograph taken by Josef de Beer at YFC Magaliesburg, Gauteng, published with permission by Josef de Beer and subsequent consent for publication given by the students.
Note: This photograph was taken in 2019, prior to the COVID-19 requirement of wearing masks.
FIGURE 3.1: Being a 'super-teacher' is used as a construct to facilitate reflection on what it means to become a teacher.

different semiotic tools for teaching and learning. These findings provide sufficient evidence that the excursion can be viewed as a high-leverage practice. Mannion, Fenwick, and Lynch (2013:792) hold similar views that 'learning outside the formal classroom experiences' provides influential learning opportunities that are often difficult to establish in university lecture rooms. The affordances that excursions hold for students are discussed next.

■ Research on the affordances of face-to-face student excursions

Engaging in virtual excursions is nascent research, necessitated by the COVID-19 pandemic. However, its design was influenced by extensive research on the affordances of face-to-face excursions. De Beer et al. (2012) highlight five affordances of face-to-face student excursions.

■ The excursion fosters improved student–lecturer relationships

De Beer et al. (2012) showed that excursions facilitated a process of teacher educators getting a better understanding of students, and student-teachers in turn came to know their lecturers better. Such mutual understanding and respect provide a conducive learning space.

■ Students learn how to negotiate rules of interaction in culturally diverse groupings during the excursion

Student-teachers will eventually work in schools where they will have to adapt to an institutional culture and negotiate rules of interaction with learners, colleagues, school management, and parents. The excursion provides a platform where the student-teachers have to negotiate rules. For example, De Beer et al. (2012:103) show that because students stay in large dormitories, such negotiation of rules is essential to facilitate collegiality within a community of practice.

■ Student-teachers develop sensitivity to cultural diversity

As De Beer and Henning (2011:213) indicate, the excursion activities were all underpinned by a sub-curriculum or subscript of inclusivity. The excursion holds affordances to sensitise student-teachers about cultural diversity, showing them that a teacher should be truly inclusive and not be 'othering' students. To sensitise students to become inclusive practitioners forms a very

important pillar of the excursion, as it can contribute to better preparing students for a diverse South African classroom context.

◼ Student-teachers are exposed to semiotic tools for teaching and learning

As De Beer et al. (2012:106) state, the university classroom is often characterised by the use of a formal academic discourse, and this 'academic language and vocabulary becomes the main semiotic tool for teaching and learning'. In contrast, the excursion allows for the use of simulation games and a pedagogy of play. Sebotsa, Petersen, and Speight Vaughn (2020) also highlight the affordances of excursions to engage student-teachers as *Homo ludens* [the playing human] (Huizinga 1955) in learning activities and underscore how such embodied cognition could support the development of 21st-century skills.

◼ Student-teachers are assisted in envisaging a professional trajectory

De Beer et al.'s (2012:108) research has shown that the excursion assists student-teachers to 'envisage professional trajectories' for themselves as teachers and to establish a stronger 'footing' and 'voice' (identity) as neophyte teachers.

In addition to the above findings, De Beer and Henning (2011) alert to another, yet complimentary, outcome of face-to-face excursions.

◼ It provides a context for 'dramatical collisions' and student-teachers' reflections on own biases and prejudices

In the next section of this chapter, we will explore what Veresov (2004) calls 'the hidden dimension' of Vygotsky's work, namely how interpersonal conflict and tension can generate change and enhance learning. During the face-to-face excursions, such tensions, or in Veresov's idiom, 'dramatical collisions', could lead to students reflecting on their own biases and prejudice, setting learning goals for themselves as truly inclusive teachers. De Beer and Henning (2011) show how the 'simulations characterising the excursions meet reality' and how the 'dramatical collisions' (Veresov 2007) which often emerge can scaffold learning and 'expansion' across the Vygotskian (1978) zone of proximal development (ZPD).

In a more recent publication, Petersen, De Beer, and Mentz (2020) add a number of other research insights related to such excursions.

▪ Whereas student-teachers might be aware of their own learning needs, they often expect the preservice programme to address these needs

The research by Petersen et al. (2020) highlights that although:

> [S]tudent teachers could identify their own needs, or even suggest strategies for learning, there is no evidence in the qualitative data to support any drive in the student-teachers themselves to address these learning goals as part of their professional development. (p. 136)

These researchers point to the 'consumerist stance' (Petersen et al. 2020:137) of the students, expecting the BEd qualification programme to address these learning needs. This shows why SDL should be an even stronger component of the excursion (also the virtual excursion), as the 'consumerism' should be replaced by students taking responsibility for their own learning. The excursion as a high-leverage practice could enhance students' SDL.

▪ The excursion creates awareness amongst students that group work has benefits for their own professional development

The excursion is based on CL principles, and students engage in small groups in all the learning activities. Research by Petersen et al. (2020:139) shows that students predominantly felt positive about working in groups. It provides students the opportunity to work on good communication skills. This is very important, as the research of Whitelaw (2007) shows that poor socialisation (for example, strained relationships between the novice teacher and his or her peers or school management) is one of the major contributing factors to high teacher attrition. He emphasises the importance of addressing what it means to work within a community of practice in preservice teacher education, and the excursion is an effective vehicle to achieve such a goal.

▪ The excursion provides students with more nuanced views on the complexity of teaching

Petersen et al. (2020) refer to the fact that first-year students often hold very naïve understandings of the intricacies of the teaching profession. Lortie (1975) refers to this phenomenon as the apprenticeship of observation. These researchers, as well as De Beer et al. (2012), show that the first-year excursion could provide student-teachers with a more nuanced understanding of the complexity of the teaching profession.

◼ Little evidence exists that student-teachers possess the skill to reflect deeply

Data obtained during face-to-face excursions indicate that 'student-teachers showed very little evidence of good and deep reflective practices' (Petersen et al. 2020:143). However, these authors show that a self-directed learner possesses good metacognitive skills, and the excursion holds affordances to promote metacognition and deep reflection if the right design principles are used.

The COVID-19 pandemic resulted in the NWU having to consider alternatives to the traditional face-to-face excursions, and this chapter will explore the conditions needed for virtual, online excursions to achieve the same outcomes and to enhance SDL. Very little work has been done on such virtual excursions, and this is a research gap that this book will address.

◼ Theoretical framework underpinning the student excursions: Social constructivism and the 'hidden' dimension of the zone of proximal development

The Vygotskyan (1978) construct of the ZPD served as the theoretical framework in the conceptualisation of the student excursion. This construct, which only started to receive appreciation amongst Western scholars after his work (published in 1935) was translated into English (in 1978), is described as (Vygotsky 1978; originally Vygotsky 1935:42):

> [*T*]he distance between the actual developmental level as determined by independent problem-solving and the level of potential development as determined through problem-solving under adult guidance or in collaboration with more capable peers. (p. 86)

Vygotsky (1978; originally Vygotsky 1935:42; Veresov 2004:1) further explained the ZPD as:

> [*T*]he zone of proximal development defines those functions that have not yet matured but are in the process of maturation, functions that will mature tomorrow but are currently in an embryonic state. These functions could be termed the 'buds' or 'flowers' of development rather than the 'fruits' of development. The actual developmental level characterises mental development retrospectively, while the zone of proximal development characterises mental development prospectively. (p. 86)

In the context of the excursion, the excursion curriculum has a goal to scaffold student-teachers' learning from their actual development to their potential development. This mediation is done by the teacher educators as well as student facilitators (cf. ch. 4) and peers. The notion of a 'super-teacher' is a

good vehicle to scaffold learning across the ZPD, as student-teachers are required to reflect on their own 'super-powers' (in the context of the super-hero narrative) as well as those weaknesses or challenges that they face as future teachers that need to be identified and pursued as learning goals.[3] These 'buds' of potential development are thus the object of the scaffolding process.

In our view, one of the leading scholars of Vygotskyan theory is Nikolai Veresov, and in order to understand the fine nuances of Vygotsky's work and the ZPD, we are going to focus on the next few paragraphs on Veresov's (2004) interpretation of the ZPD. Nowadays working at Monash University, this scholar's Russian roots enables him to interpret the fine nuances in Vygotsky's work against the Russian context in which he worked.

Vygotsky (1983) explained that learning takes place on two 'planes':

> [*A*]ny function in the child's cultural development appears on stage twice, that is, on two planes. It firstly appears on the social plane and then on a psychological plane. Firstly, among people as an interpsychological category and then within the child as an intrapsychological category. This is equally true with regard to voluntary attention, logical memory, the formation of concepts and the development of volition. (p. 145)

Veresov (2004) shows that the reference to *categories* (namely the interpsychological and intrapsychological categories) should be carefully considered in terms of the Russian context in which Vygotsky worked. Veresov (2004:6) highlights that, in prerevolutionary Russian theatre, the word 'category' meant 'a dramatic event, collision of the characters on stage'. Vygotsky, who was very fond of Russian theatre, purposefully used the term 'category' to highlight the *very nature* of the social relation (or social learning), namely as 'emotionally coloured and experiencing collision, the contradiction between people, the dramatical event, drama between two individuals' (Veresov 2004:6). This is an aspect that often escapes the attention of Western scholars of Vygotsky's work, and the (face-to-face) excursion provides a stage where such collisions and contradictions could scaffold learning much better than in a 'sterile' university classroom (De Beer & Henning 2011).

Similarly, the 'two planes' is also Russian theatre language, referring to the front (or first) plane and the back (or second) plane. Veresov (2004:7) explains that the first plane is where the main events of the performance happen. The category appears twice on the stage of a student's development: first interpsychologically in the social interaction with other people (and the 'dramatical collisions') and then intrapsychologically (on the second plane) when the student reflects on the learning experience and internalises it.

---

3. This will be seen in Chapter 13, the same super-hero narrative characterised the Health Sciences virtual excursion.

The emotional collision that characterises social relations in Vygotsky's work brings, in Veresov's (2004) parlance:

> [*R*]adical changes to the individual's mind, and therefore it is a sort of act of development of mental functions – the individual becomes different, he becomes higher and above his own behaviour. (p. 7)

Veresov (2004) views this 'emotional collision' that characterises social learning as the 'hidden dimension' of Vygotsky's work. This 'hidden dimension' quickly revealed itself during the first (University of Johannesburg [UJ]) educational excursion in 2007, where students' social and pedagogical boundaries were stretched or expanded (De Beer & Henning 2011). De Beer and Henning (2011) described the excursion curriculum as creating a social situation where student-teachers:

> [*W*]ould 'play' on a safe 'stage' and their scripts would be about the macro-social challenges that a teacher has to face in the micro-context of his/her classroom. (p. 6)

Given this context, the education excursion has always been characterised by a pedagogy of play (Sebotsa et al. 2020; Taljaard 2018). Again, this is aligned with Vygotskyan principles (Vygotsky [1933] 1966):

> Play creates a zone of proximal development of the child. In play the child always behaves beyond his average age, above his daily behaviour; in play it is as though he were a head taller than himself. As in the focus of magnifying glass, play contains all developmental tendencies in a condensed form and in itself a major source of development. (p. 101)

Vygotsky (1986) also emphasised the value of drama in the teaching-learning situation:

> The basic principle of the operation of the higher psychological functions (= personality) is a social interaction. [...] They can be accomplished to the full extent in the form of drama. (p. 55)

A hallmark of the excursion has therefore been to also utilise play and drama as pedagogies. One of the learning activities during the face-to-face excursion is that student-teachers need to do a stage production of a case. These cases portray scenarios that teachers would face in their classrooms. Shulman (2002:2) explains cases as 'a way to bridge the abstract nature of principles and teaching standards to classroom practice'. Cases tell 'vivid, often moving stories, and give life to abstract principles, and are more likely to be remembered' (Shulman 2002:2). Students must, after reading the case study, rewrite it in the form of a screenplay, do casting, and then dramatise the events. In the words of Athiemoolan (2018:58), drama provides student-teachers the opportunity to 'project their interpretations of educational issues and challenges for deeper interrogation as they experience them through embodied learning'. De Beer et al. (2020:198) alert to the value of drama in 'helping student-teachers to think about their personal or social dilemmas, explore issues and situations, and formulate possible effective solutions'.

■ The migration from face-to-face student excursions to virtual online excursions: The design features

The NWU obtained a UCDG from the DHET, as was explained in Chapter 2. Because of the COVID-19 pandemic, we realised that a face-to-face excursion with 300–500 students at a time would be a super-spreader of the disease. It was then decided to explore the possibility of hosting virtual online (face-to-screen) excursions. Based on years of research on face-to-face excursions, we have distilled the following design principles for such an online, virtual excursion:

1. The virtual excursion should be characterised (like the face-to-face excursions) by a pedagogy of play. Students should engage in various learning tasks as *Homo ludens* (Huizinga 1955), the 'playing human'. However, this poses a challenge in an online learning environment, and we realised that we would have to explore the options that gamification poses (cf. ch. 9).

2. The literature shows that PBL and CL hold affordances to enhance SDL (Barrows 1984; Loyens, Magda & Rikers 2008; Sebotsa et al. 2020). These have always been a trademark of the face-to-face excursion, and we realised that PBL and CL should be the pillars on which the virtual excursions build. It was therefore decided to structure the virtual excursions around an ill-structured problem, namely the video diary of the newly appointed principal of a dysfunctional school. This 20-min video portrays several problems in the school, for example a lack of teaching and learning resources, transmission ('chalk-and-talk') approaches that do not enhance SDL, unprofessional teacher behaviour (e.g. teachers arriving late to class), inappropriate teacher behaviour (sexual relationships with learners) and teachers not being sensitive to issues of inclusivity and social justice. Student-teachers then, in their CL groups, had to identify the problems faced by the principal in the school, and they also had to suggest possible solutions to these problems (cf. ch. 7 for PBL and ch. 8 for CL).

3. It had to be a synchronous virtual excursion, in which we could maintain a sense of personal engagement and connection (Craven 2020). The plenary sessions were done in real-time, with the teacher educators responding to students' feedback in the studio. Craven (2020) shows that such a synchronous event could assist the facilitator in gauging the students' comprehension and thought processes. The facilitators tried to create an inviting and informal atmosphere, just as during face-to-face excursions.

4. The virtual excursion had to be structured in a way that would ensure three core elements in the online environment – cognitive presence, social presence, and teaching presence (Fiock 2020) (cf. ch. 11). Refer to Figure 3.2,

Source: Photograph taken by Ian du Plessis in the Green Room in D1 Building on the North-West University Potchefstroom Campus, published with permission by Ian du Plessis and adequate consent given by the photographed individuals.

FIGURE 3.2: The two authors, both teacher educators in the 'green room' responding to students' inputs during the synchronous learning event.

where the facilitators react to students' inputs in a synchronous manner in the studio.

5. The virtual excursions should enhance SDL, and therefore the students must set personalised learning goals for themselves.

6. We wanted the students to engage in a creative assessment task in CL groups. It was decided to engage students in making multimodal e-posters, on which they reflected on a turn-around strategy for the dysfunctional school (cf. ch. 10).

7. In order to ensure that students work in culturally diverse groups, we randomly divided them into small CL (break-away) groups of five, and we furthermore ensured that a quota system was maintained upon registration, ensuring representation from the Potchefstroom, Mahikeng, and Vanderbijlpark campuses.

8. As explained earlier in the theoretical framework section, we wanted to create a safe but disrupting space, that could foster social relations (or social learning), as Vygotsky (1978) and Veresov (2004:6) see it, namely as 'emotionally coloured and experiencing collision, the contradiction between

people, the dramatical event, drama between two individuals'. This was easier said than done, as a face-to-screen environment does not necessarily trigger the same 'emotional and visceral experiences' (De Beer & Henning 2011:205) as face-to-face excursions.

9. It was the first time we ventured to plan a virtual excursion. From the literature, we have not received much guidance as to what the guiding principles of such an excursion should be. Our demeanour as teacher educators, from the onset, was to be prepared to make continuous adjustments to the structure of the excursion, in order to ensure that the students experience an optimal learning opportunity. This relates to the withitness which is discussed in detail in Chapter 11.

The design principles informed the scaffolding used to assist the students learning in their ZPD and is summarised in Figure 3.3.

The choice of the activities included in the excursion programme was informed by the described design principles. In Table 3.1, we briefly describe the different learning activities student-teachers engaged in during the virtual excursion, which will be followed by the methodology.
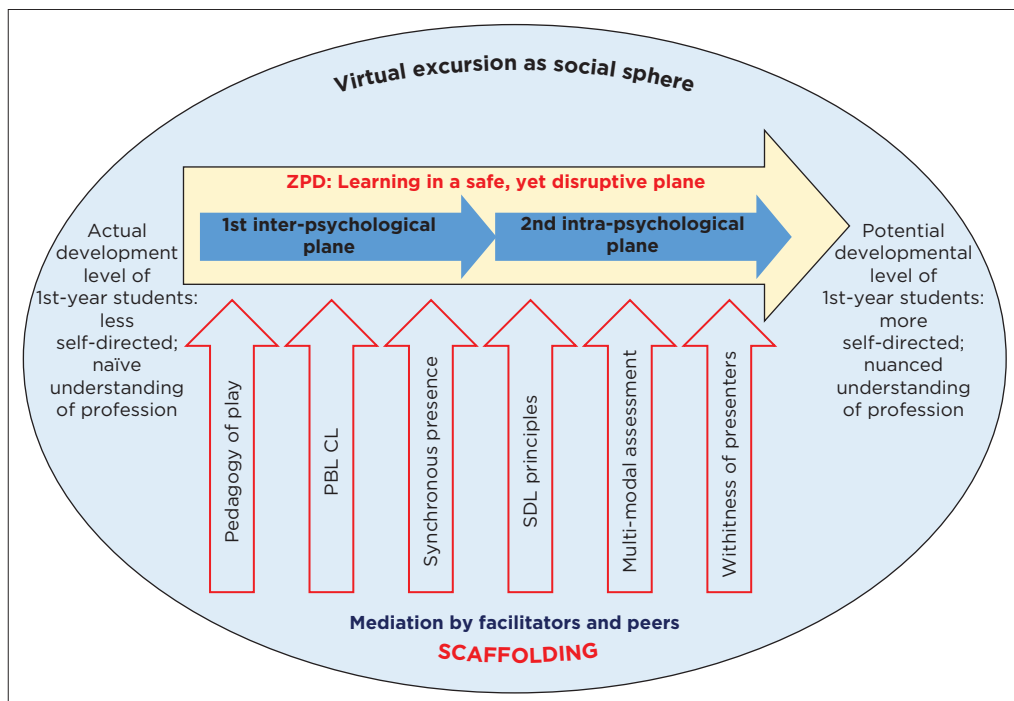
Key: CL, cooperative learning; PBL, problem-based learning; SDL, self-directed learning; ZPD, zone of proximal development.
FIGURE 3.3: How the design principles influenced scaffolding in the social constructivist learning environment.

Table 3.1: Learning activities during education's virtual excursion.

Name of learning activity	Probing question for the activity	Short description of the activity	Rationale behind the activity	Possible development of SDL skills
Interrogation of ill-structured problem: PBL video	What are the problems faced by the school and what can be done to overcome these problems?	It was expected from students to discuss all the challenges and possible stereotypes they identified in the video (from their own perspectives) and suggest possible solutions	• The ill-structured problem, in the form of a problem-based learning screen played in the video, serves as a contextualisation and driver for all the other activities over the duration of the 2-day excursion	• Reflective skills • Communication and listening skills in the cooperative learning groups
Being resourceful and an agent of change	How can a teacher be innovative, when teaching in an under-resourced school, to ensure that effective teaching and learning resources are used?	Students were encouraged to be innovative and think of examples of using shoestring (frugal) approaches in their different school subjects	• Students need to realise that they might teach at an under-resourced school, but that they should have the agency to take responsibility to use shoestring alternatives	• Reflective skills • Higher-order thinking skills such as problem-solving and creativity • Realisation that they do not know how to look for and/or design shoestring (frugal) approaches and convert that into own developmental needs/goals • Communication and listening skills in the cooperative groups
The 'Famine and Abundance' game	A teacher must teach in diverse classrooms, also in terms of socio-economic conditions (students who 'have', and those who can be described as the 'have-nots'). How could this be addressed in the inclusive classroom? How can we as teachers address gender inequality in the classroom?	A virtual passport of a country is randomly provided to each student. Student-teachers also receive virtual money, based on the Human Development Index of the country. This funding can be used to purchase food in the virtual 'excursion shop'. The outcome is that students from 'rich' countries can buy whatever they want, whereas students from 'poor' countries can hardly afford anything	• How to be an inclusive practitioner? • Student-teachers have to reflect on the socio-economic divide in the country, and how the teacher needs to deal with the disparity between the 'haves' and the 'have-nots' • The goal of this activity is the realisation that an inclusive practitioner should create a safe learning environment for all the learners in the classroom	• Students reflect on the implications for them as future teachers • The realisation that they have biases which may be a barrier to being an inclusive practitioner and converting that into their own developmental needs and goals as self-directed learners • Communication and listening skills in the cooperative groups
Breaking the cycle of 'chalk-and-talk'	'Chalk-and-talk' (transmission mode) approaches are never a good idea. The teacher should always attempt to promote self-directed learning and the development of 21st-century skills. How can a teacher's pedagogy support self-directed learning and ensure the realisation of higher-order thinking skills and affective outcomes?	Students were encouraged to be innovative and think of examples of engaging pedagogies and how they can be introduced in their different school subjects	• Exposing students to using engaging pedagogies and a pedagogy of play such as CL, PBL, gamification, and the inclusion of arts (for example puppetry, drama, and music) to teach for the affective domain. The reality that students experienced (that these pedagogies really work) may play a role to confront the apprenticeship of observation	• Reflective skills • Higher-order thinking skills such as problem-solving and creativity • The realisation that they do not know how to use engaging pedagogies and converting that into their own developmental needs and goals • Communication and listening skills in the cooperative groups

Key: SDL, self-directed learning; CL, cooperative learning; PBL, problem-based learning.

■ Research methodology and findings

Each of the chapters in the book focuses on a specific aspect related to the excursion and the related research. However, the UCDG grant, submitted to the DHET, posed the following overarching research questions that guided the research:

1. What is the influence of a virtual excursion on students' views of their SDL?
2. How could a virtual excursion enhance students' sense of belonging and identities as NWU students?
3. How should the initial design principles on which the excursion was based be adapted to ensure enhanced learning?
4. What is the role of excursions in providing students with more nuanced understandings of the professions (and the complexity thereof) that they chose?

A mixed methods design was followed in this research project. Students' views on their SDL were determined using the SDLI of Cheng et al. (2010) (cf. ch. 5). However, Mentz and De Beer (2021:179) advocate for a mixed methods approach to SDL research, as quantitative instruments such as the SDLI tend to not show nuanced improvement with short interventions. Very often, the qualitative data provides a 'thick description' (Geertz 1973) of the phenomenon. For this reason, an open-ended questionnaire was also used, and this was supplemented by focus group interviews. Coding of the qualitative data was done utilising the technique described by Saldaña (2009). In several of the chapters in this book, CHAT is utilised as a research lens. Mentz and De Beer (2021:167) state that the often seemingly contradictory quantitative and qualitative findings in SDL research could be interrogated using CHAT as a research lens. The latter authors state that CHAT could provide a nuanced meta-inference in the research. Ethical clearance, as well as gatekeeper permission was obtained, and this has been described in detail in Chapter 2. In the paragraphs that follow, a holistic overview of the main findings will be briefly described.

■ A bird's-eye view of the findings: The affordances of virtual excursions for self-directed learning

In the chapters that follow, the findings emerging from the data will be described in detail. This section attempts to provide a holistic overview of the main findings, in a nutshell, and is structured around the four main research questions that guided the research.

☐ What is the influence of a virtual excursion on students' views of their self-directed learning?

As will be explained in detail in Chapter 5, there was statistically significant improvement in students' views of their own SDL in all four domains of the

SDLI questionnaire, namely students' learning motivation, planning and implementing, self-monitoring, and interpersonal communication. The data strongly point to the affordances of the virtual excursion, building on problem-based and CL principles, to enhance SDL. The qualitative data also show that students formulated learning goals for their own professional development, especially in terms of communication skills, information and communications technology (ICT) skills, engaging pedagogies, and time management.

☐ How could a virtual excursion enhance students' sense of belonging and identities as North-West University students?

As explained in Chapter 2, the virtual excursion was especially valuable to distance learning students in terms of their sense of belonging and emerging identities as NWU students. The data suggest that the virtual excursion enhanced students' sense of belonging and, in a period of COVID-19 isolation, a sense of a 'community of practice'.

☐ How should the initial design principles on which the excursion was based be adapted to ensure enhanced learning?

Earlier in this chapter the design principles underpinning the current virtual excursion were explained. In true DBR, adaptations had to be made based on data obtained during the series of 13 Education excursions to ensure optimal learning. In the various chapters of this book, recommendations are made in terms of enhancing the learning opportunity for students. In Chapter 4, the need for a stronger service-learning component is highlighted. Glitches in terms of CL should also be addressed (cf. ch. 8), and gamification (cf. ch. 9) should be further enhanced.

☐ What is the role of excursions in providing students with more nuanced understandings of the professions (and the complexity thereof) that they chose?

In Chapter 5, it will be shown that many students, prior to the excursion, held very naïve understandings of the complexity of the teaching profession. Only 7.62% of students viewed themselves as completely under-prepared to go and teach. An alarming 92.38% of students felt that they could immediately enter the classroom and teach. The qualitative data shows that the excursion did manage to alert student-teachers to the complexity of the profession, and that they, as self-directed learners, should set learning goals for their own learning and professional development.

■ Conclusion

As will be shown in this book, the teacher educators experienced a much deeper and more focused engagement and reflection amongst student-teachers in the virtual excursions, compared to the face-to-face excursions (2017–2019). Earlier in this chapter, the 'hidden dimension' of Vygotsky's take on social constructivism, as embodied in his ZPD construct, was discussed. It was shown that the 'dramatical collisions' that often emerge in the face-to-face excursions provide a powerful vehicle for reflection, introspection, and learning. An aspect that would need attention in future is how learning situations could be created in a virtual, online environment that would incubate such 'dramatic events, collision of the characters on (the virtual) stage', more than what was experienced in 2021 (Veresov 2004:6). The 'Famine and Abundance' game (cf. ch. 9) addressed this to some degree, but in a face-to-screen environment, it lacked the intensity experienced during the face-to-face excursions. In some of the break-away rooms, such 'dramatical collision' was experienced to various degrees (cf. ch. 4), but this should be enhanced in future virtual excursions. Paul and Jefferson (2019:3) describe a real-time face-to-face interaction as dynamic because it 'sparks innovative questions'. To bring students closer to 'dramatic events', designers of virtual excursions should think of how face-to-screen excursions can be better packaged to provide opportunity for such 'innovative questions' that will spark lively discussions that may lead to students confronting their own biases and prejudices (their own 'demons'), especially with regards to inclusivity and social justice issues.

Developing capacity on several levels: Scaffolding learning, leadership development, and service-learning

Elize Küng
Education and Human Rights in Diversity (Edu-HRight) Research Unit,
Faculty of Education, North-West University,
Vanderbijlpark, South Africa

Lloyd Conley
Office of the Executive Dean, Educational Leadership,
Faculty of Education, North-West University,
Potchefstroom, South Africa

Lounell White
Research Unit Self-Directed Learning,
Faculty of Education, North-West University,
Potchefstroom, South Africa

■ Abstract

In this chapter, the authors reflect on the feasibility of establishing a service-learning opportunity for senior BEd students to address a community-identified need. Based on the need to provide facilitation for first-year students

during online excursions, the authors demarcate service-learning as an experiential pedagogy before exploring the link between SDL, leadership, and effective service-learning in a virtual environment as a development opportunity for senior BEd students.

■ Introduction

The world as we know it is fast changing. The current COVID-19 pandemic has just added to an emerging awareness of the need to change how education happens, created by the focus on the Fourth Industrial Revolution. The realisation of the impact of automation and artificial intelligence on the future are but two of the many uncertainties the future holds (Petersen, Gravett & Ramsaroop 2020). In this fast-changing world, HEIs – especially in developing countries such as South Africa – must adapt to meet the requirements of a highly competitive global society by delivering graduates that have the required attributes to function in the world of today and tomorrow.

Over the last decade, HEIs across the world have been pondering the question – what does a student require upon graduation to succeed in the world? – leading to a concern about delivering students with abilities that surpass disciplinary knowledge, students who are not only ready for the fast-changing world but also display a social responsiveness and active citizenship (Bitzer & Withering 2020). The history of sub-Saharan Africa, including South Africa, created a situation where African HEIs face an additional challenge and a critical role to navigate the legacy of the past in order to deliver socially responsive graduates who contribute to the transformation of the African, and in our case, the South African, society whilst remaining globally competitive.

As a university in sub-Saharan Africa, NWU, not unlike other universities, aims to deliver students who are not just ready for the world of work and life in general, but by fostering a culture of innovation, also developing graduates who are prepared to solve the problems encountered in the real world. The NWU aims to produce graduates ready for constructive participation in public life whilst leading fulfilling professional and private lives. In order to deliver graduates displaying the aforementioned profile, the NWU bases its teaching and learning strategy on at least three paradigms:

- Pedagogical paradigm which relates to the university's responsibility to educate students in terms of their respective disciplines as well as the skills linked to collaborative, cooperative, and SDL.
- Cognitive paradigm relating to the university's role in expanding knowledge and which is focused on facilitating knowledge acquisition.
- Pragmatic or instrumentalist paradigm relating to the practical role a university is required to fulfil in the preparation of students becoming active, useful members of the society they live in. Unlike the previous two

paradigms, this paradigm links to external goals, including (amongst others) social justice, diversity, and transformation (NWU 2020).

According to the National Departments of Education (Department of Education [DoE] 1997; DHET 2013), HEIs have a duty to observe the need for transformation (DHET 2013). This duty includes, amongst others, the promotion and development of social responsiveness (DoE 1997) through community engagement activities linked to the academic programme (DHET 2013), creating social and societal awareness amongst students through their involvement in these programmes (DoE 1997). In acknowledgement of the aforementioned duty, the NWU Faculty of Education has embarked on a plan to award students opportunities for engagement with communities by means of community engagement and service-learning. Integrating service-learning into teacher education courses embraces the NWU Teaching and Learning Strategy whilst empowering graduates prepared for the world of work.

Societal interest in schools often focuses on teachers' failings in terms of creating a conducive classroom environment (Cochran-Smith 2015). This can easily lead to simplistic conclusions about what constitutes effective teaching and learning and, of especial interest for this chapter, leadership as well as what the expectations for resolving these complex challenges are (Cochran-Smith 2015). The continued public debate regarding the schooling system's failings can be assumed to have an impact on student-teachers' notions concerning their leadership ability. Brophy (1988) specified 'two simplistic and common variants with regard to student-teachers' notions about what is required of a teacher as a leader' (see Samuelsson & Colnerud 2015:2 of 10).

One notion was that leadership consists of discipline and that respect is gained through others being subservient to the teacher's authority. The other notion is characterised by a naïve idealism and a romanticised view of human nature, which is why student-teachers holding this notion underestimated the complexity of school leadership. In both cases, it is necessary that those who educate teachers repeatedly contribute to ensuring that student-teachers' notions of leadership become more nuanced throughout their teacher education (Samuelsson & Colnerud 2015:2).

Jones (2006) 'conducted a systematic research review concerning student-teachers' leadership training. He demonstrated common failings in teacher education programmes' (Samuelsson & Colnerud 2015:2 of 10). He postulates that the training led to a much too general and theoretical approach; the students were not given an opportunity to develop their practical ability to lead. Furthermore, they were seldom prepared for teaching in difficult settings such as multicultural and multimodal environments. Jones also 'pointed out that the university lecturers who taught student-teachers lack practical experience of what is required in terms of leadership in the contemporary classroom' (Samuelsson & Colnerud 2015:2 of 10). It has been 15 years since Jones's study and a literature search

indicated that the same issues have been occupying the minds of various authors (Häkkinen et al. 2017; Jamwal 2012; Mathewson Mitchell & Reid 2017; Rani 2017; Rusznyak 2016) over the years.

COVID-19 added another dimension to the teacher education experience in that the online modality became part of the expectations for student-teachers to include in their range of skills. The focus of this chapter is the report of research findings involving senior BEd students in leading the facilitation of learning of first-year students during online excursions as a service-learning opportunity. As indicated previously, it is important for student-teachers to experience practical leadership opportunities, learn the art of building relationships within teams, define identities and achieve tasks effectively. Acting as facilitators to multiple diverse groups of first-year students afford opportunities to achieve the aforementioned whilst displaying effective communication and interpersonal skills.

In order to reach the aim of the investigation – to evaluate the feasibility of establishing a service-learning opportunity for senior BEd students to address a community-identified need, the need to provide facilitation for first-years during online excursions, the authors will demarcate service-learning as an experiential pedagogy before exploring the link between SDL, leadership, and effective service-learning in a virtual environment as a development opportunity for senior BEd students.

■ Service-learning as community engagement

In accordance with White Paper 3 (DoE 1997), the Council for Higher Education considers one of the core functions of higher education to be engagement with local and broader communities. Institutions are required to use their expertise and resources to address issues relevant to the communities they serve (CHE 2007). Community engagement by HEIs may refer to various service programmes. Furco (1996) distinguishes between five types of service programmes. These are:

- **Volunteerism:** Volunteerism implies an inherent, altruistic nature to the activities undertaken by the service provider where the primary intended beneficiaries of the service are the recipients of the service. The activity undertaken, or service rendered, focuses on providing a service to the recipient with no intended benefit for the provider of the service. Any benefit the provider may experience is unintended and unanticipated.
- **Community service:** As in the case of volunteerism, community service implies altruism, but is more structured and requires more commitment from students. Community service activities call for engagement of students in activities primarily focused on providing a service and the benefits the service holds for the recipients. The benefit for the students providing the service is a better understanding of the cause, what needs to

be done to address the needs of the beneficiaries, and how the service rendered benefits the recipients.

- **Internships:** Internship programmes aim at involving students in service activities with the main purpose of creating an opportunity for hands-on learning experiences. In this instance, the student is the primary intended beneficiary as the activity focuses on student academic learning and the acquisition of relevant skills. During an internship, a student may receive remuneration, but this is not always the case.

- **Field education:** WIL or teaching practice is what Furco (1996) describes as field education in the South African context. During their formal academic programme, students are required to participate in activities involving work-integrated learning to gain a deeper understanding of their field of study. Although significant attention is paid to the service offered, it is the student who benefits most.

- **Service-learning:** Service-learning differs from the aforementioned service programmes in that it is considered as an experiential pedagogy aimed at equal benefits to the service recipient and the service provider (Petersen & Henning 2018). Service-learning programmes require academic context and to be designed in such a manner that the service augments learning, and the learning augments the service. The student is required to apply theories and skills acquired in the academic course to render the service. Thus the focus is on student learning, whilst a much-needed service is rendered, whereas teaching practice mainly focuses on the benefits for the student who learns from an experienced teacher how to teach (Petersen et al. 2020). Cloete and Erasmus (2012) consider the primary factors to epitomise the different elements of service-learning as *serving* (the community), *learning* and *reflection*, whilst Furco (1996) stresses the need to balance the elements in service-learning by asking what the focus of service is, what the focus of learning is, and who is the beneficiary?

Thus, when one considers Furco's (1996) classification of types of community engagement, it becomes clear that volunteerism and internship lies on opposite sides of a continuum; the one has at its core the benefits to the recipient of the service, whilst the other has at its core the benefits to the student. Whilst community service and field education move more toward a balancing of benefits to both parties, there is still an imbalance between one side and the other present. Only when service-learning activities are undertaken do we find an equalisation of benefits to both parties.

As becomes clear from the official documents referred to previously, HEIs need to engage with the communities they serve and share expertise, whilst creating students with an awareness of the needs of the communities they will work in. Considering that service-learning takes community engagement to a deeper level than volunteerism and community service, as it encourages learning that is connected as well as the development of transdisciplinary

skills and character (Barton 2019), it is the ideal vehicle to develop values of social justice and care within student-teachers (Cloete & Erasmus 2012). Petersen et al. (2020) opine that although teacher education promotes the principles of social justice and care, it remains a challenge to find ways to embed the meaning of these values in education into the thinking of student-teachers.

As the NWU Faculty of Education embarked on a plan to create opportunities for each education student to partake in a service-learning opportunity, the different models of service-learning were taken under consideration. Heffernan (2001) proposes the following different models of service-learning:

- **The discipline model:** According to this model, students are required to use course content from their disciplinary field on which to base their analyses and understanding of the problem, have a presence in the community throughout a semester, and reflect regularly on their experiences.
- **The problem-based model:** Within the problem-based model, students are required to work with the community, much like a consultant with a client, to understand a problem in the hope that the student will draw on known theory to make recommendations or solve the problem.
- **The capstone course model:** In this module, mostly senior students majoring or minoring in a discipline are asked to use the knowledge acquired throughout the course to address a community problem. The aim is for students to draw on what they have learnt in their course and combine it with the service they are rendering with the aim of exploring a new topic or synthesising their understanding of the topic.
- **The service internship model:** The internship model is often considered more intense than typical service-learning experiences in that it requires students to spend an extensive number of hours in a community setting. During the service-learning experience, students are required to produce knowledge that is valuable to the community regularly, and ongoing reflection must be created to assist the student to analyse new experiences using discipline-based theories. Reciprocity is the main focus as students and the community must be benefitted equally.
- **The undergraduate community-based action research model:** Students and faculty members collaborate closely to allow students to learn research methodology whilst serving as advocates for the community and the issues of importance to the specific community.

As may have become clear in Chapter 2, the context of the NWU is unique. The NWU Faculty of Education, for instance, presents aligned teacher education courses across three campuses as well as in a distance learning mode. The implication hereof is that communities in which students find themselves vary greatly on all levels, geographically, socio-economically, and

culturally. Apart from the great differences in the student body served, the faculty offers a variety of undergraduate and postgraduate courses. After careful consideration, the best-suited model to address the diverse needs of communities, students, and courses is the service internship model as an overarching model, whilst each individual service-learning project may adhere to the characteristics of the other models mentioned.

The service internship model requires students to complete a set number of hours within a community setting, during which the student has to work towards addressing a community-identified problem. Whilst completing the service-learning component, continuous reflection is created, guided by the lecturers responsible and aimed at inspiring the student to analyse new experiences using discipline-based theories. The focus of this model is on reciprocity, thus it equally benefits the community and students (Heffernan, in Bandy 2011). Erickson and Anderson (1997 in Petersen et al. 2020) set the following conditions for the integration of service-learning into teacher education programmes:

- The integration of service-learning throughout a variety of courses in the programme with a gradual increase in what is required from first year onwards.
- Placement periods over substantial time periods.
- No need for the service-learning sites to be perfect models for service-learning projects.

Keeping the aforementioned in mind, the decision to consider the facilitation offered by the senior students to first-year students as one of many possible service-learning projects within the BEd programme was investigated. In order to evaluate the feasibility of the idea, it is important to measure the envisaged project against the characteristics and ideals of service-learning as found in literature and to consider if the experience provides opportunities to enhance a student's SDL and leadership skills.

■ Characterising service-learning

The inclusion of service-learning into initial teacher education programmes holds potential to provide beginner teachers with the required knowledge and skills to face the complexities of teaching in the 21st century (Petersen et al. 2020). According to Petersen and Henning (2018), student-teachers not only require knowledge of pedagogies and content, but also need to understand how education provision requires care and service *for* and *with* others and how societal factors may impact these. Service-learning as experiential pedagogy epitomises education as lived experience (Dewey 1916), as it requires students to draw on the academic content in offering a service in response to a community-identified need (Petersen et al. 2020),

leading to an understanding of a need for care and social justice (Petersen & Henning 2018). Petersen and Petker (2017:1) verbalised the experience: 'they learn *about the world* by being *in the world* and *reflecting* on it', allowing for students to reinterpret academic content through real-life experiences within authentic social settings (Cloete & Erasmus 2012).

Service-learning can thus be demarcated as a course-based, democratic, collaborative, and communal teaching and learning strategy, where students, community members, and faculty form partnerships aimed at promoting personal growth, academic enhancement, civic learning, and the advancement of the greater common good. In these partnerships, students, community members, and faculty all serve as 'co-educators, co-learners, co-servers and co-generators of knowledge' (Petersen et al. 2020:3). When students are encouraged to develop a committed relationship with the community, it can lead to fostering intellectual curiosity, which in turn leads to the emergence of new energy, capacity, and creativity within the community and the student alike (Cloete & Erasmus 2012).

Peterson et al. (2020) argue that service-learning encourages the development of specific types of knowledge and competencies for student-teachers. According to the authors, the most prominent are: the cultivation of the moral and civic mindset required for teaching in beginner teachers; the development of service-oriented beginner teachers who use leadership and communication skills to work in diverse teams; students who are active contributors to their own learning, thus self-directed learners, who create and co-create knowledge with others; and beginner teachers who have the ability to communicate with their peers and community members. Because service-learning asks of them to describe what they learn in their own language, they learn how to talk to their peers and the community members to enhance their own learning.

Ideally, a service-learning project should be rooted in a reciprocal partnership relating to both academic content and issues of concern in a specific community (Petersen et al. 2020), where the student teacher can develop knowledge *of* teaching as well as *for* teaching, by reflecting-on-action and reflecting-in-action (Schön 1983) in a safe environment (Ramsaroop & Petersen 2020). The reciprocal relationship provides for students to recognise that knowledge gained from experience is a legitimate form of knowledge (Petersen & Henning 2018).

As the community forms one of the pillars of service-learning, the importance of establishing a community partnership cannot be underscored, especially given that service-learning requires a balance between service and learning (Cloete & Erasmus 2012). An established community partnership leads to community engagement, which in turn leads to civic engagement, however one needs to determine who the community is. The term 'community'

signifies a social grouping of society involved in an interaction at any given moment. Communities range from an HEI's internal community, such as its staff and students, to an array of external communities (e.g. 'communities of interest' and or 'communities of practice') in the public or private sector, either locally, nationally or internationally (Balfour 2021; NWU 2021). In order for service-learning programmes to succeed, the specific needs of the community must be identified, recognised, respected and adhered to within the partnership (Cloete & Erasmus 2012).

Service-learning creates authentic learning opportunities, both in practice and from practice, during which social, cultural, ideological, political, and historical elements are intertwined, resulting in students who learn to care for others and to recognise their responsibility in developing a society with social justice at its core (Petersen & Petker 2017). However, Cloete and Erasmus (2012) point out that when involved with service-learning, students have to cope with an array of unfamiliar non-academic situations, and therefore, it is imperative for the students to be comfortable with the academic material used in the service activity whilst being provided with support and guidance from the lecturers.

Critical reflection as a cognitive process, both reflection-in-action and reflection-on-action (Schön 1983), as well as reflection-for-action (Thompson & Thompson 2008) form an integral part of the framework of a service-learning project. By integrating reflective forms of personal and professional knowledge with academic knowledge, students comprehend the implication of academic knowledge for practice (Petersen & Petker 2017). Students are required to critically examine their experiences to transform the experiences into usable knowledge through guided reflection activities in order to enhance the quality of their learning as well as their service (Petersen et al. 2020), whilst also reflecting on future encounters with the community, but also in their future classrooms and how what they learn now may impact on future actions (Olteanu 2017). Cloete and Erasmus (2012) consider reflection the most significant element of service-learning, as it compels students to question assumptions they may have, identify questions that may arise from the experience and to link what they have learnt, or are learning, in the academic context with real-life within the community (Eyler, in Cloete & Erasmus 2012). Reflection *in*, *on* and *for* action, along with the critical process of service-learning and the cooperative nature of service-learning projects, can encourage a move from technical levels of reflection to contextual and dialectical levels of reflection (Ramsaroop & Peterson 2020). When reflecting on a contextual level, students must be able to interpret and elaborate on underlying biases within the practice, or themselves, as well as question the consequences of strategies. Dialectical reflection requires the student to analyse, question, and reconsider experiences to continuously adjust practices with the aim to improve the service and gain knowledge (İlin 2020).

From the discussion above, it has become clear that the envisioned project adheres to the characteristics of a service-learning activity. The need for facilitation was identified by the community involved; the senior students have academic knowledge of the theoretical underpinning of facilitation, as they have been exposed to the relevant theory throughout their previous years of study in a variety of didactic and professional studies modules, whilst senior students, faculty members involved, and first-year students all have the opportunity to benefit from the service rendered. The reflections of the senior students are analysed in the following section and will provide insight into the success of the service-learning opportunity. Before moving to the analyses of the student experiences, the authors will explore possible links between service-learning, SDL, and leadership development.

■ Linking service-learning, self-directed learning and leadership development

At the onset of the chapter, the authors indicated that a link between effective service-learning, SDL, and leadership development will be explored. In this regard, Petersen et al. (2020) mention (1) leadership and (2) communication skills, with the ability to communicate with diverse groups of peers and community members, as well as the ability to (3) create and co-create knowledge and become active contributors to own learning, amongst the competencies and types of knowledge developed by service-learning.

Within the pedagogy of service-learning, student voice and student experience lie at the core of the learning (Osman & Petersen 2010), thus authenticating the student's contribution to own learning and the creation of knowledge (Petersen & Petker 2017). As a pedagogy, service-learning forces students to recognise how their own experiences contribute to their own learning whilst acknowledging the knowledge within the community they serve, which goes beyond the university and the curriculum. Students move from consumers of knowledge to producers of knowledge in alliance with the community they are serving, albeit a small, localised community, such as a school, or the broader community, according to the cultural, social, and historical context in which they find themselves (Petersen & Henning 2018). Service-learning assists students to take an active role in their own learning, to learn through experience, their own and the experiences of others, and to view their group members as experts in their own right (Petersen & Petker 2017), thus pointing to a direct link between SDL and service-learning.

Earlier in the chapter, the authors referred to concerns about student-teachers' notions of leadership in the classroom and the failings in teacher education programmes when it comes to leadership training. Specific reference was made to Jones (2006) and his view that student-teachers are not given opportunities to practice leadership skills in practice. Huda et al. (2018)

considers service-learning programmes as an ideal vehicle to provide students a chance to get involved in the community in order for their civic responsibility and leadership skills to grow. The authors postulate that involvement in solving community-identified needs leads to the social and emotional development of students, as service-learning requires solving a problem in a well-planned setting.

Service-learning enhances leadership awareness. Leadership awareness refers to, amongst other things, an awareness of how to solve issues timeously with rational ideas; thus, problem-solving and decision-making skills are required (Huda et al. 2018). The thinking style associated with leadership awareness oscillates between ideas and implementation, allowing students to keep an open mind, grow along, and exhibit rational thinking skills, whilst at the same time they gain insight into achieving goals without undermining others (Huda et al. 2018).

Teachers need to constantly redefine the way they see their positions, their tasks, and roles, ensure that they stay relevant if they want to survive the uncertainties held by the future, whilst at the same time preparing the youth in their care for the unknown to come (Petersen et al. 2020). What holds true for teachers and schools holds true for universities and specifically faculties of education, as they train the teachers for an unpredictable or unknown future. Therefore, universities are obliged to ensure that the teachers they train are prepared to display flexible and adaptive leadership skills, and service-learning is ideally situated (Huda et al. 2018).

Flexible and adaptive leadership involves adapting behaviour in appropriate ways as changes occur (Yukl & Mahsud 2010). Flexible and adaptive leadership is becoming more important to teachers as the pace of change affecting organisations increases. Over the last decade, one thing became very clear, and that is for teachers to survive, they have to adapt rapidly, more so with the onset of COVID-19. Challenges such as globalisation and international competitiveness, rapid technological change and advancement, changing cultural values, interacting with a diverse workforce or learner component, 'new forms of social networking, increased use of virtual interaction requir[ing] more visibility of leader actions' and an increase in the need for flexibility, adaptation, and innovation (Yukl & Mahsud 2010). For leaders, adaptability is about having ready access to different ways of thinking, enabling leaders to shift and experiment as things change. Adaptability is a key skill needed to not only survive but also to thrive. Adaptive leadership 'helps individuals and organisations adapt and thrive in the face of challenge and prepare them to take on the process of change' (Western Governors University 2021). Traditionally, the leadership role of a teacher was seen to mainly encompass the ability to make decisions, to inspire others to learn, and to be able to resolve conflict (Nadelson, Booher & Turley 2020), but the teacher entering the workforce today has to deal with diversity at all levels, technology in and

outside the classroom, and the ever-changing social media environment, to name but a few.

■ Research methodology

In Chapter 3, the role of excursions aimed at preparing first-year students for the intricacies of their chosen career, the move from face-to-face excursions to online excursions, and the pedagogy of play have been discussed. The focus of this chapter will be on the use of 3rd and 4th-year BEd students as facilitators during the online excursions.

This qualitative research focused on the facilitation experiences of senior BEd education students during the virtual excursions of first-year students. The aim of the virtual excursions was to create a platform for first-year education students to confront their own naïve understandings, biases, and prejudices regarding education (cf. ch. 3).

The research questions that guided this research are:

- What were the overall experiences of senior students during the facilitation of the virtual excursions?
- How does SDL enhance the senior student's own service-learning?
- How does service-learning contribute to the development of the senior student's leadership role?

Because of the COVID-19 context, the university changed the face-to-face excursions to a virtual platform (cf. ch. 3). The virtual sessions for the first-year education students over a two-day period were organised in this manner:

- Each new topic was introduced by teacher educators on a Zoom platform during a plenary session which all students attended. To ensure synchronous teaching and learning, the teacher educators were present in a studio whilst the first-year students attended the sessions online.
- The plenary session was followed by a short group discussion where the first-year students formed break-away groups to discuss the dilemma which was highlighted during the plenary session. CL underpinned these discussions in the break-away rooms, and each first-year student was assigned a specific role (e.g. a communication specialist – cf. ch. 8).
- A feedback session concluded each topic where first-year students were exposed to the discussions held in the other groups and the commentary of the lecturers.

It was during these break-away groups sessions that senior students supported first-year students during their group discussions. The facilitators comprised 13 senior students from all three contact campuses. As these senior students attended the face-to-face first-year excursions during their own first year of study, they had a good background knowledge on the different concepts that

were offered to students on the virtual platform. In addition to their own background knowledge, face-to-face training for the senior students were conducted on the different campuses to inform them on their facilitation roles.

The training for senior students included a video on previous face-to-face first-year excursions depicting the various themes that were offered on the camp. This functioned as a reminder of the different topics that were addressed during a first-year excursion, followed by a PowerPoint presentation indicating the main topics that would be addressed during the virtual excursion. Senior students were alerted on the main topics that would be offered to the first-year students. These included an ill-structured problem where students were expected to identify the difficulties a principal experienced in a school setting which was implied in the principal's video diary shown to the senior students. Other topics that were addressed were teaching-on-a-shoestring (frugal) approaches to support schools with limited budgets and the 'Famine and Abundance' game which alerts students to the implications of teaching in culturally diverse classrooms (cf. ch. 9). To break the talk and chalk cycle in a classroom, students were also exposed to different engaging pedagogies which can be used in a classroom to enhance the teaching methodology. The aim of the senior student training was to provide them with background knowledge to support their facilitation of first-year students.

Adding to this training, the elements of CL were discussed with the senior students. Each break-away group of first-year students consisted of five students, and it was envisaged that each first-year student would fulfil a different role in the group discussion namely that of materials manager, quality controller, facilitator, communication specialists, and technology fundi. These roles were discussed in depth with the senior students for them to give guidance in the group discussions and support first-year students with the different roles.

It was emphasised that senior students should not take part in the conversations of first-year students, but they should play a supporting role in ensuring that first-year students stay on the right track during the discussions and follow a CL approach, clarifying any misconceptions which the first-year students may experience. This is aligned to what has been discussed in Chapter 3 on scaffolding learning across the Vygotskyan 'zone of proximal development'.

Data were gathered through written reflections by senior students on their own experiences during their support of first-year students. Online focus group interviews were held with open-ended questions to assist the senior students in their reflections. Written reflections were already in a transcribed format, but focus group interviews were transcribed and the data were coded into categories and themes (Saldaña 2013).

Senior students' participation was completely uncoerced, and only data from students willing to contribute were used. The research was explained to the senior students, and they signed consent forms indicating that they were willing to participate in the research. Students were assured of the anonymity of their contributions and it was indicated to them how their information would be communicated.

■ Research lens: Third-generation Cultural-historical activity theory

The third-generation CHAT as described by Engeström (1987) was used as a research lens to analyse the data of this research. Cultural-historical activity theory (CHAT) has its roots in the works of Vygotsky (1978), who indicated that learning occurs in a social context by using cultural tools and artefacts (cf. ch. 3). Leontiev (1978) expanded this theory by introducing an activity aspect which includes tasks and actions, and these activities are determined by an object of the activity system. Engeström (1987) extended the theory further (hence the third-generation theory) by specifying that an activity is divided between different members of a community, which therefore requires a division of labour which must be governed by rules.

CHAT is depicted as a triangle composing of different elements which encompass:

- The subject can either be an individual or a group that directs the activity towards an object (Engeström 1999) or can be dehumanised when a systemic approach is followed (Rogoff 1995).
- An object provides the purpose of the activity system (Kaptelinin 2005), defines the target, and helps in the interpretation of the activity system.
- Tools refer to the instruments, which are either material or cultural products and are used to mediate interactions between the subjects of an activity system (Ogawa et al. 2008). Engeström (1987) indicates that technical and psychological tools can also be used within the activity system.
- The community includes all the individuals within the activity system which share the same object (Engeström 1999).
- Rules define the regulations and norms within the activity system and are both behavioural and instructional in nature (Hardman 2008), but Engeström and Sannino (2010) point out that rules can also be restrictive in nature.
- Division of labour refers to both the tasks that can be shared by members within the community as well as the division of power and authority (Engeström 1999).

Tensions within CHAT are the driving force for transformation within the system. Transformation is necessary to convert initial ideas into an object,

thereby leading to changed practices or theoretical concepts (Engeström & Sannino 2010). Engeström (1987) identified different levels of tensions, namely (1) tensions within a specific element of the activity system, (2) tensions between different elements of an activity system, and (3) tensions between different activity systems. Engeström (2001) indicates that identifying tensions within an activity system gives direction in realising the object within the system. These identified tensions can either be problems within the system which need improvement, or they can be reinforcing factors which suggest growth within the activity system.

This research studied two interconnecting activity systems, which Engeström (2001) points out does not only allow a researcher to study the different aspects within an activity system but also broadens the research to incorporate the interaction between two activity systems.

Rogoff (1995) identified different levels on which CHAT can be used. Firstly, on a personal plane where the subject of the activity is a single individual; secondly, on an interpersonal plane where the subject of the activity is characterised by the interaction between different individuals; and lastly, on

Source: Adapted from De Beer and Mentz (2016).
Key: SDL, self-directed learning.
FIGURE 4.1: Cultural-historical activity theory on an institutional plane with self-directed learning and service-learning as two interconnecting systems.
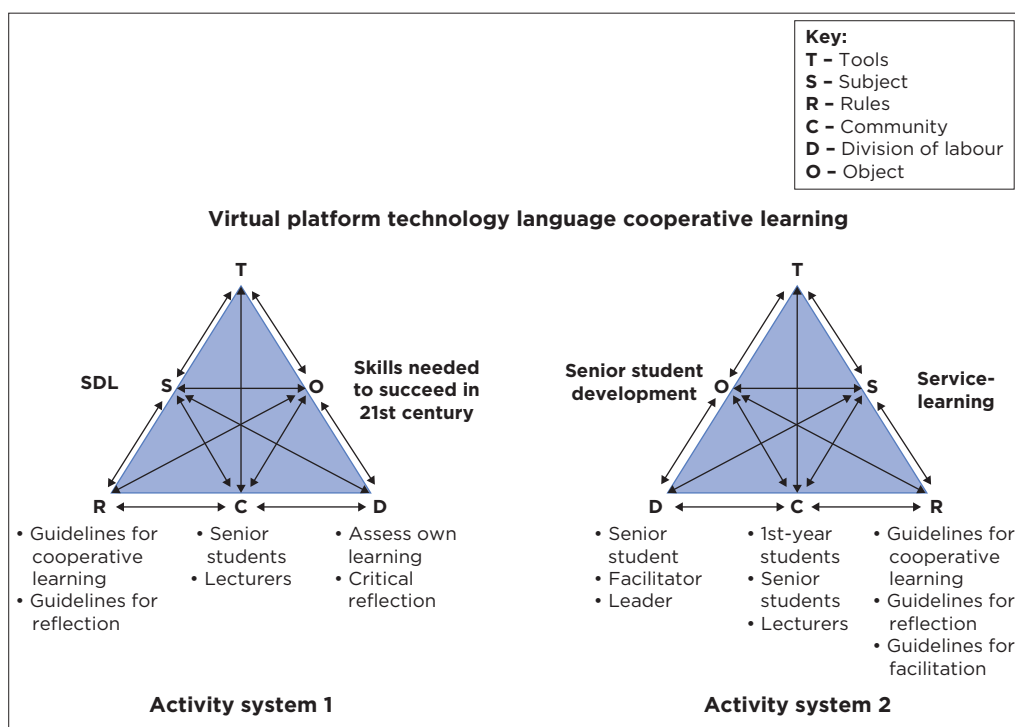
an institutional plane where the subject represents a phenomenon and not a person. Rogoff (1995) indicates that although one plane may be the centre of the research, the other planes are still in the background during the research.

◼ Activity system 1: Self-directed learning

The subject of activity system 1 refers to SDL as a process (Knowles 1975) with the object to develop 21st century skills (Wagner 2014) and take ownership of one's own learning. The senior students who acted as facilitators during the group discussions together with the teacher educators who gave guidance during the plenary sessions, as well as first-year students, formed part of the community. The five elements of CL as described by Johnson and Johnson (2009) (cf. ch. 8) formed the tools of this activity system. The tools are linked to the rules of the activity system as senior students had to provide first-year students with guidelines on how to function within a CL environment. The division of roles referred to the senior student's ability to assess their own learning through reflection practices, as well as their roles of facilitating first-year students' learning.

◼ Activity system 2: Service-learning

The subject of activity system 2 refers to service-learning as experiential learning as described by Furco (1996) to enhance the senior student's own learning (object of the activity system). The development of the senior students took place in an online learning environment where they acted as facilitators to other adult learners (first-year students). In this activity system, a virtual platform was used where CL took place in small break-away groups. First-year students discussed (using language) ill-defined problems that were presented to them during plenary sessions. As the training took place on a virtual platform, all students (first-year and senior students) used their own technology to participate in the discussions. Senior students acted as facilitators during these discussions, and the division of labour refers to the different roles that the senior student had to adopt during the virtual excursions, from that of student (where they foster their own development during service-learning) to that of facilitator (where they supported first-year students) to that of leader (where they had to take lead and solve problems) to a reflective practitioner (using critical reflective skills whilst they were facilitating first-year students). First-year students participating in the online excursions, senior students acting as facilitators, and teacher educators presenting the plenary sessions and driving the online excursions formed part of the community of activity system 2. The rules for activity system 2 refer to the guidelines of facilitation which the senior students had to adhere to, which was provided to them during their own face-to-face training, as well as the guidelines of CL driving the group discussions in the break-away groups.

■ Findings and discussion

Tensions identified in these activity systems are discussed under three identified themes. The themes firstly indicate how service-learning can be used as a vehicle to develop the senior students' own learning and leadership development and secondly how it can be applied to support first-year students. The third theme reported on the importance of inclusivity in education from the viewpoint of senior students.

■ Service-learning as vehicle to develop senior students' own learning and leadership development

There was an alignment between the object and subject in activity system 1, which points to reinforcing factors as indicated by Engeström (2001).

Senior students identified several aspects where the role of them being a facilitator supported their own learning. Identified aspects by senior students included the gaining of new knowledge, enhancing their own facilitation skills, conflict resolution, and supporting their own personal growth, which is evident in the findings as discussed next.

Senior students were of the opinion that service-learning should be introduced into the university during the student's 4th year: 'so if we introduce the service-learning, it will educate or equip them on how to work with learners and their communities' (Senior student, female, 24 November 2021) as they will '[…] learn how to work with others' (Senior student, male, 24 November 2021).

As indicated previously, senior students were responsible for the facilitation of first-year students during a virtual excursion and felt that they could transfer their experiences learnt to their own classrooms in future. One student specified that:

'[…] the advantages were being able to act as a facilitator, and that aided in my teaching career that at some point you won't have to be a teacher but a facilitator in the classroom.' (Senior student, female, 24 November 2021)

One senior student indicated that service-learning enhanced her own personal growth as it provided her with an opportunity to '[…] saw it as a challenge that will give me great experience as both an individual for personal growth and as a teacher' (Senior student, female, [n.d.]).

Some senior students indicated that their own knowledge was enhanced during the facilitation process as indicated:

'[…] listening to students giving their answers during the discussions because they were able to open my mind about some of the content that I did not know.' (Senior student, female, 24 November 2021)

It was also pointed out by students that the process of communication is important when one facilitates students within a group, as indicated by one student:

> '[…] how do you interact with people? How you communicate with people plays a huge role in someone's life. Because you can communicate and not being aware that you are communicating something in a tone that is not okay, not okay with everyone.' (Senior student, female, 24 November 2021)

Leadership skills such as organisational and time management skills of senior students were enhanced during the facilitation process, as two students pointed out:

> 'I enjoyed that I had to manage a group of people and having to guide them through what they are doing, and that boosted my confidence that I was able to make them one.' (Senior student, female, 24 November 2021)

> 'I have learned how to manage my time, which was the most important thing, because we were required to enter the meeting 10 min before (the session started).' (Senior student, female, 24 November 2021)

Senior students were also able to dissolve conflict situations within the first-year groups, as two students indicated:

> '[…] because I had to lead, guide my students, and act as a facilitator and how to resolve disagreements because we are different people, and we have different personalities.' (Senior student, female, 24 November 2021) and

> 'Then the challenge that I had is that in my room, we had a heated disagreement, and I am proud of myself because I was able to resolve it.' (Senior student, female, 24 November 2021)

Vygotsky (as explained by Veresov 2004) refers to 'dramatical collisions' (Veresov 2004:6) between individuals as an important learning process where contradictions in a social setting (such as in this case a cooperative group) later lead to the internalisation of information; thus, a person (student) learns by disagreeing with one another when they argue a point. From the findings, it is not clear whether senior students managed the discussions of the first-years or put an end to the discussions.

Senior students indicated that they could function independently in the break-away rooms as specified:

> 'So, in this process of facilitating, remember that you need to come up with ideas on how to facilitate your learners, that time you are alone in a room because we were all given a room.' (Senior student, male, 24 November 2021)

Information gained during their own training could be applied to novel situations, as one senior student indicated:

> 'But then I was able to think on the spot […] asking me these questions helped me take initiative of answering questions that were not even part of the whole facilitating program.' (Senior student, female, 24 November 2021)

Individual problems, however, were experienced by some senior students using the virtual platform (which indicates a tension within the tools node), as indicated:

> 'The challenging aspect of the facilitation was the technical part, having to work around the different meet rooms on the online platform.' (Senior student, female, date unknown)

Senior students were able to overcome these problems which indicate a tension between tools and the division of labour. One senior student highlighted this following problem-solving technique:

> '[…] we had one student who was not in the group, so we took the initiative of creating a WhatsApp group chat so that we can chat with her on the WhatsApp group, because she mentioned that she did not have a laptop.' (Senior student, female, 24 November 2021)

This points out that senior students took up a leadership position and portrayed problem-solving skills necessary for the 21st century (Wagner 2014; Yukl & Mahsud 2010). Organisation qualities and self-confidence were identified by Horishna et al. (2019) as leadership qualities, whilst problem-solving and autonomy also refer to important leadership skills (Bell et al. 2019).

The findings indicate that students experienced service-learning as a process that developed their teaching and adaptive leadership skills and assisted in their own personal growth.

■ Service-learning as support to first-year students

There was a synergy amidst the members of the community, as there was a mutual understanding of the scaffolding role of the student's facilitators to support learning for first-years, as one student indicated:

> 'I see this facilitation as part of service-learning because we are still undergrads and helping our junior colleagues with their virtual excursion to meet their learning goals.' (Senior student, female, date unknown)

Senior students were able to reassure first-year students within their groups:

> '[…] I had to remind them that being a first-year is not hard. Being a first-year, you have your confusions, yes, but as facilitators we are here to help you.' (Senior student, female, 24 November 2021)

This support to first-year students extended beyond the facilitation process of the virtual excursion, as one student indicated:

> 'Even now, some of the first-years, I am with them now. I am helping them with Life Sciences and helping them with Geography.' (Senior student, male, 24 November 2021)

These findings are consistent with the research of Petersen and Petker (2017), who drew attention to the care aspect for others during service-learning.

Importance of inclusivity in education

Responses from senior students indicated that they realised that inclusivity is important for education in a culturally diverse community within South Africa. During the focus group interviews, they did not only refer to their experiences during their facilitation period with first-year students but linked their experiences to school classrooms during their WIL phase.

Language as a barrier to learning was identified by a senior student, '[…] to learn that language can be a barrier to learning' (Senior student, female, 24 November 2021) when they facilitated the first-year students 'because other students when I was facilitating, they could not speak fluently, so they did not speak most of the time' (Senior student, female, 24 November 2021). This points to a tension between the tools and community in activity system 1.

Some students were able to link their experiences on language as a barrier, which they gained on the virtual platforms, to their WIL experience in schools, as one student indicated:

'And then with the WIL teaching in English, I was teaching EMS [*economic and management sciences*] for Grade 7. They even told me that they can't speak English and we cannot hear you. So I had to use code-switching.' (Senior student, female, 24 November 2021)

This finding indicates that senior students were able to apply information gained within their facilitation experience to their WIL practice. Code-switching is referred to in the literature as a mechanism to overcome language as a barrier for learning in South African schools (Mavuru & Ramnarain 2020).

Referring to the language, senior students reiterate that it is important to include all learners when teaching, as one student indicated: '[…] therefore, we need to make sure that everyone is included (to prevent that) other learners have to feel like they are outsiders' (senior student, female, 24 November 2021).

Tensions between activity system 1 (service-learning) and activity system 2 (SDL) were also identified. One senior student decided to do her own research on English as a teaching language as a barrier to learning. She indicates:

'I did some research about it because I was like, "There is no way that language can be a barrier towards learning, because we could use English," but [*it*] could be seen as a barrier because other learners do not understand English. We had practical, and I had to go to the rural areas, and language is a learning barrier because other learners do not understand English.' (Senior student, female, 24 November 2021)

This implies that this senior student could apply SDL principles, because she was able to identify her own learning goals and access her own information, as described by Knowles (1975). Referring to the language, she stressed the importance of inclusivity within a classroom: 'I also learned that inclusivity is really important, especially when you are working with different people […]' (senior student, female, 24 November 2021).

Senior students also referred to inclusivity when they spoke about the use of technology, which can pose a barrier to learning. Tensions were therefore identified within the tools node of activity system 1, as it was evident that problems were experienced with the network, as indicated: 'When students ask questions, they will break down during the discussion' (senior student, female, 24 November 2021).

Senior students were able to link skills that they had been exposed to during the virtual excursions to their future world of work. Referring to technology, students pointed out:

> '[…] how you can put that in place and how you can integrate it in your lesson and also having to be mindful of the fact that there were going to be challenges and how you as a teacher going to tackle them and make sure that everyone is aligned; everyone is feeling like they are in the classroom, that is inclusivity.' (Senior student, female, 24 November 2021)

> '[…] it [*taught*] me a lot with having to create activities, for example, that you make sure that the learners can access the materials and you have to be inclusive in everything that you do as a teacher so that they do not feel left out because of what they cannot control.' (Senior student, female, 24 November 2021)

Senior students were therefore able to identify two problem areas within the virtual platform which posed problems that they were able to solve and furthermore link it to their world of work as future teachers.

The findings of this research suggested that service-learning is beneficial for senior students' own learning experiences in that they were able to apply their learning in novel situations and were able to link their experiences to their future world of work, suggesting also that service-learning could act as a system support to first-year students.

◼ Conclusion

The aim of this chapter, as previously stated, was to investigate the feasibility of establishing a service-learning opportunity for senior BEd students as facilitators for first-year BEd students during online excursions. The possibility of using senior students originated from discussions regarding possible risks during the planning stages of moving from the face-to-face excursions to the virtual excursions. The findings of this research suggest that incorporating senior students can enhance the experiences of first-year students on a virtual platform.

In all the discussions with the senior students about their involvement as well as during the training, the focus was more on their role as facilitators and less on the importance of reflection on their experience and subsequent feedback. In future, more attention will be paid to these concepts. Another focal point to include in the training of senior students in future is the learning

opportunity created by disagreement, or as Veresov (2004:6) so beautifully coins it, 'dramatical collisions' between members of a group, especially a diverse group. However, despite limited feedback, the authors are of the opinion that establishing facilitation of first-years by senior BEd students during online excursions is a great opportunity to include in the faculty plan to enculturate service-learning into the faculty programmes.

From the findings, it becomes clear that many of the characteristics of service-learning are evident. There are clear indications of reciprocity (senior and junior students learning from one another); students linking the experiences to the life as teachers that they are about to enter; application of theoretical knowledge they have gained during their training; and recognition of the need for good communication skills and personal growth. It was encouraging to read that one of the participants acknowledged that her rendering of a service to the junior students has continued beyond the excursions, pointing to the need for care in education as well as development of a social responsibility. Student feedback also indicated elements of SDL, with feedback pointing to senior students doing their own research to develop a greater understanding of problems students and learners may face, in conjunction with bringing their experiences of the facilitation during excursions in relation to experiences during WIL. There are also indications of the service-learning providing the needed practical experience of the need to use leadership skills in real life. Two students reported the need for them to step into conflict situations, requiring them to adapt to a situation and display awareness of the need for leadership, decision-making, and problem-solving.

Whilst there are a number of future improvements to be made, such as creating stability by allocating the same facilitator to only one or at most two groups per excursion, a greater focus on reflection-on-action, reflection-in-action, reflection-for-action, and a greater focus on the role of feedback, the overall findings indicate that there lies potential in creating an opportunity for senior students to act as facilitators as a service-learning project.

First-year students' conceptions of the complexity of the profession, sense of belonging, and self-directed learning

Neal Petersen
Research Unit Self-Directed Learning,
Faculty of Education, North-West University,
Potchefstroom, South Africa

Elsa Mentz
Research Unit Self-Directed Learning,
Faculty of Education, North-West University,
Potchefstroom, South Africa

Josef de Beer
Research Unit Self-Directed Learning,
Faculty of Education, North-West University,
Potchefstroom, South Africa

■ Abstract

Teaching as a career is one of the most complex and challenging professions (Shulman 2004). Although universities cannot train and completely prepare student-teachers for all events or circumstances which they may encounter once they start to teach, universities can play a role to develop their agency to address the eventualities and the constant change associated with life in the 21st century. In short, it means that universities should deliver student-teachers who are self-directed, lifelong learners, and adaptable to be successful as teachers. Reality might pose a challenge to deliver such student-teachers because literature indicates that first-year student-teachers often hold very naïve ideas of the complexity of their profession. Lortie (1975) referred to this phenomenon as the 'apprenticeship of observation', which suggests that student-teachers have predetermined notions of teaching because they had observed their teachers for 12 years (or more). Student-teachers think they can teach, without necessarily having knowledge of what happened 'behind the scenes' before and after a lesson. To address the deleterious apprenticeship of observation, this mixed methods study reports on how a virtual educational excursion for first-year BEd students at NWU can be utilised to sensitise students about the complexities of teaching. The NWU started to offer virtual excursions in 2016, and during the excursion, a pedagogy of play was used to sensitise students about the complexity of the profession, and students were required to formulate personal learning goals for themselves. During the excursion, the student-teachers were exposed to different aspects of the profession (such as lack of resources, unprofessional behaviour, and social justice issues), and students were challenged to identify their own areas of development and to convert them into learning goals for themselves. The excursion therefore created an opportunity for students to develop their own self-directedness. Because the excursion was scaffolded in such a way that the student-teachers from all three campuses of the university, worked in small diverse CL groups of five, the excursion also held the affordance that the students would learn from and with each other, learn to communicate and collaborate with different cultures to achieve the outcomes, and in so doing develop a sense of belonging as students at this university, although they came from different campuses (cf. ch. 3). The preliminary data indicate that the student-teachers who participated in this excursion indeed held naïve ideas of the profession, but the excursion resulted in a more nuanced understanding of the complexity of the profession and provided them with SDL skills to identify their own learning needs and to take responsibility for their own learning. The SDLI was administered in a pre-intervention and post-intervention context, and a statistically significant change in self-directed learning was observed. Whilst working together as a diverse group, student-teachers learn to communicate

and work with different cultures, resulting in a sense of belonging as students from the same institution (cf. ch. 3). CHAT is used as an analytic heuristic to illuminate the findings of this research.

■ Introduction

Troesch and Bauer (2020) argue that the attrition of teachers poses challenges to many countries. This is especially true for beginner teachers in the Netherlands, as reported by Den Brok, Wubbels and Van Tartwijk (2017). García and Weiss (2019) indicated that teacher attrition is also a problem in the United States. In South Africa, attrition of teachers is also a challenge and concern because teachers are leaving the profession at an alarming rate (Centre for Development and Enterprise [CDE] 2015; Hugo 2018). There are many factors that influence the attrition of teachers. We regard these factors, described below, as a type of barometer of the complexity of the teaching profession.

Literature describes numerous factors contributing to the attrition of (beginner) teachers. Amongst others, some of these reasons include: profession-specific demands (physical, social, and organisational aspects) with regards to assessment and how students learn (Troesch & Bauer 2020); a lack of sufficient skills to use relevant resources which may cause feelings of stress (burnout) (Smith 2014; Voss & Kunter 2019); demanding workloads, time pressure, and bureaucracy that play out in general low well-being (Skaalvik & Skaalvik 2018; Smith 2014); a feeling of social isolation because of a lack of support, collegiality, and poor management or support from leadership or their mentors (Buchanan et al. 2013; Smith 2014); discipline problems and problems with controlling their classrooms (Hong 2010); or a disillusioned feeling as a result of the underestimation of the profession (Smith 2014). All these factors contributing to this universal challenge of the attrition of teachers mentioned above point in one way or another to different aspects entailed in the teaching profession, which many teachers experienced as problematic. In this chapter, we are of the opinion that these factors confirm the fact that teaching is a complex profession.

This notion of the complexity of teaching is very well encapsulated in Shulman's (2004:504) statement when he articulated classroom teaching as 'perhaps the most complex, most challenging, and most demanding and frightening activity our species has ever invented'. Adding to the reasons described above, the CDE (2015) reported that poor quality initial teacher education (ITE) programmes do not adequately prepare teachers in all the aspects of the profession. In this regard, Gravett (2012) argues that universities might even contribute to the theory-practice divide where student-teachers are not adequately prepared for the realities of

classroom practice. Gravett (2012:1) further states 'in fact, we teach students that they should "apply" theory to practice'. Gravett (2012:1) states that universities are 'party to the separation'. Based on the findings of the CDE of poor initial teacher training, as well as Gravett's (2012) assertion that universities contribute to the theory-practice divide, educators in faculties of education should clearly take note of these risk factors when planning their teacher training programmes. Although university ITE programmes can never fully prepare students for all the complexities and events that classroom practice entails (Gravett 2012), they should put measures in place to foster student-teachers who possess the agency to cope and be adaptable to the constantly changing realities of classroom practice. One of the objectives of this chapter is therefore to report on how a virtual education excursion, as part of the training of first-year education students, was used to expose students to the many different aspects of the teaching profession in order to sensitise them about the complexity of the profession. A further aim of the virtual excursion is that students should realise the complexities of the teaching profession, identify their own learning needs and convert it into personalised learning goals which can enhance SDL.

In the introduction, we suggested that student-teachers should have the agency to cope with the challenges that the teaching profession poses. In this chapter, we argue that such student-teachers should be self-directed and lifelong learners, able to adapt to the challenges faced by the profession in order to be successful as future teachers. The demands of a changing 21st century will require them to demonstrate skills as self-directed learners. Kim, Raza, and Seidmen (2019:100) 'call for essential competencies and skills beyond literacy and numeracy, otherwise known as 21st-century skills'. The same authors further express the hope that improved 21st-century teachers' skills will eventually translate into 21st-century learners. In turn, they asked the question: 'how can we improve student-teachers' 21st-century skills to help produce 21st-century learners' (p. 100)? Astuti et al. (2019:1) argue further that the purpose of education in the 21st century should be: (1) 'preparing people in the dynamic and unpredictable world, (2) fostering creative behaviour, (3) giving freedom for unique individual intelligence, and (4) producing innovators'. In order to enable teachers to actualise the purpose of education in practice, Astuti et al. (2019:2) advocate for teachers to possess the following skills set: 'digital skills to master the digital world', 'agile thinking abilities' to think in different settings, 'interpersonal and communication skills' to argue, 'global skills' (such as multilingualism and to work with people from diverse backgrounds), and to have a thoughtfulness to diverse cultural values and practices. In a globally complex society, teachers need to hold higher-order skills such as complex thinking, communication, collaboration, and creativity (Kim et al. 2019; Soulé & Warrick 2015).

The activities used during the virtual excursions were underpinned by a pedagogy of play, exposing student-teachers to the different aspects of the profession (such as lack of resources, unprofessional behaviour and social justice issues) and challenging them to identify their own areas of development or learning needs. Student-teachers were probed to convert their own learning needs into personalised learning goals. The excursion therefore creates an opportunity for student-teachers to develop their own self-directedness. A further objective of this chapter is therefore to determine if the virtual excursions did sensitise the student-teachers about their own self-directedness.

Innovative and engaging pedagogies (Smagorinsky & Barnes 2014) refer to progressive pedagogies which are needed to arrest the phenomenon which Lortie (1975) called the 'apprenticeship of observation', and to support student-teachers in developing 21st century skills. Lortie's apprenticeship of observation, in short, suggests that teachers teach as they were taught after observing their teachers for 12 years or more. De Beer, Petersen, and Dunbar-Krige (2012) further argue that student-teachers often have naïve understandings of the profession. They do not have insight into all the aspects of teaching, because they often do not know what happened before and after lessons. In this regard, Borg (2004) argues that student-teachers only have a partial view of a teacher's job. The challenge for ITE programmes is to confront the apprenticeship of observation in so far as to scaffold student-teachers learning to be aware of this phenomenon, but more importantly with the agency to change this deep-rooted phenomenon when they start teaching one day. During the virtual excursion programme, students were in *Homo ludens* [the playing human] mode (Huizinga 1955), whilst they were exposed to the different aspects of the teaching profession and how to develop a sense of belonging as NWU students.

As an initiative of the South African government to transform higher education, NWU was formed through the merger of the University of North-West (campus in Mahikeng) with the Potchefstroom University for Christian Higher Education (with two campuses, one in Potchefstroom and the other in Vanderbijlpark) – refer to Chapter 1 for more background on the mergers. The NWU as a unitary institution is dedicated to operate in an integrated, multi-campus university that enables equity, redress, and globally-competitive teaching and research across all three of its campuses. Students studying at the NWU therefore need to adopt the NWU identity and behave accordingly. However, in spite of the NWU identity, each of these three campuses has its own identity as well. These campus identities are, in spite of our democracy of 27 years, still often informed by remnants of their old fibre and demographics before the merged NWU. Student racial profiles on the Mahikeng and

Vanderbijlpark campuses are predominantly black, whilst it is predominantly white on the Potchefstroom campus (although this is rapidly changing). The ODL students are also predominantly black. Table 5.1 summarises the demographics of the NWU.

This is also true for the Faculty of Education's racial student profile (see Table 5.2).

It is important to mention these racial profiles because one of the pillars of the excursion is to expose student-teachers to different forms of diversity, of which race is one. Furthermore, it was important that small cooperative groups in which they worked during the entire excursion were also diverse, composed of different races and campus representation. Our experiences from previous face-to-face excursions since 2016 were that students from the different campuses held strong views (stereotypes) of each other, many of those along racial lines. We strongly believe that excursions like these provide the opportunity for student-teachers from different campuses to learn from each other's cultures and practices and can contribute to form a common NWU identity for the Faculty of Education's students (Petersen, De Beer & Mentz 2020). Yet a further objective of this chapter is to determine if the virtual excursions create opportunities where student-teachers could learn from each other and develop a sense of belonging as NWU Faculty of Education students. This is an important focus of most FYE programmes (Van Zyl 2010), and we argue that virtual excursions could assist with social and academic integration of first-year students at university, which Tinto (1988, 1993) has identified as an important factor for student success.

TABLE 5.1: The 2021 undergraduate demographics of the North-West University.

Campus/delivery mode	Black	Coloured	Indian/Asian	White	Unknown
MC	12 070	90	26	20	–
VC	5721	134	80	622	20
PC	6630	1180	282	10 173	3
ODL	7126	721	152	1880	10

Source: NWU Department Strategic Intelligence (2021).
Key: MC, Mahikeng Campus; VC, Vanderbijlpark Campus; PC, Potchefstroom Campus; ODL, Open Distance Learning.

TABLE 5.2: The 2021 Faculty of Education undergraduate demographics.

Campus/delivery mode	Black	Coloured	Indian/Asian	White
MC	2321	18	2	6
VC	1718	36	17	170
PC	1055	385	16	1522
ODL	6836	666	141	1715

Source: NWU Department Strategic Intelligence (2021).
Key: MC, Mahikeng Campus; VC, Vanderbijlpark Campus; PC, Potchefstroom Campus; ODL, Open Distance Learning.

The overarching research question that guided the research on which this chapter reports is: how does a virtual first-year BEd student excursion influence students' understandings of the complexity of the teaching profession, their sense of belonging, and their SDL?

■ Theoretical and conceptual frameworks

■ Theoretical framework

□ Social constructivism

The first-year student excursion is underpinned by social constructivism, and the facilitators designed an excursion programme to scaffold students' learning across the Vygotskyan 'zone of proximal development' (Vygotsky 1978) – as has also been discussed in Chapter 3. Cultural-historical activity theory, which has its roots in social constructivism, is used as a research lens in analysing the data (see Methodology section).

■ Conceptual framework

□ First-year students in higher education institutions in South Africa

According to a report from Universities South Africa (USAf) (n.d.), student populations are becoming more diverse, coming from different backgrounds in terms of race, gender, class, age, and level of tech-savviness; many are first-generation students. First-generation students can be described as those students who are the first in their families to embark on higher education studies. Universities South Africa (n.d.) data indicated that of all first-year students entering tertiary studies, 70% are first-generation students, of which 79% are black, 9% white, 5% coloured and 2% Indian (cf. ch. 2).

First-year students generally show a large dropout and poor pass rate (Tinto 1993). A USAf report states that students have unrealistic expectations of their own preparedness when they enter university and usually under-estimate how difficult tertiary studies can be (USAf, n.d.).

Adding to the situation of first-year students, Arends and Petersen (2018) reported that operating on different campuses, large classes, and dealing with literacy issues (in the context of English as medium of instruction rather than a first language) are some of the challenges students have to face. Arends and Petersen also reported that students believe that good social experiences are one of the factors preventing them from dropping out. In this regard, Koo, Baker, and Yoon (2021:81) refer to 'social connectedness' of how students fit in and adapt to the university environment (cf. ch. 2). To improve graduate retention and output, these issues related to students' enculturation into

tertiary education should be addressed (Arends & Petersen 2018; also refer to the discussion on the research by Tinto in ch. 2).

The USAf (n.d.:5) report on our understanding of the kind of students we are enrolling at our institutions suggests that first-year students do have 'positive attitudes towards their studies, are optimistic about their potential to succeed, have high aspirations and demonstrate an intention to work hard'. Strydom, in the USAf report, argues that teacher educators should capitalise on the overall positive disposition of students. This is evident in his statement (USAf n.d.):

> As universities, we are not able to take away the problems relating to the schooling system or problems of financial stresses suffered by our students. But universities can still do something: they can change how teaching and learning happens, how students are orientated to the FYE, how tutorials are managed, and how students receive academic advice. (p. 5)

As the designers and presenters of this virtual education excursion, we are strongly of the opinion that the excursion contributes positively to the FYEs of students. The excursion's activities are presented and scaffolded in such a way that student-teachers are optimally engaged during the socially interactive learning experiences where they learn from presenters and each other, start to know each other better, and (it is to be hoped) build their sense of belonging as an NWU student.

☐ Self-directed learning

Malcolm Knowles (1975) can be seen as the father of SDL, and he defines it as a process in which the learner (with or without the help of others) determines their own learning needs, sets their own learning goals according to the identified needs, selects and finds their own learning resources and strategies to achieve the learning goals, and evaluates their own learning outcomes. Although Knowles' definition of SDL (1975) still forms the basis of SDL research today, the International Society for Self-Directed Learning (2021) webpage summarises SDL as 'an intentional learning process that is created and evaluated by the learner'.

To enhance SDL amongst students, they should be supported to take increased responsibility for directing their own learning. Therefore, it is important to create student-centred environments where they are the architects of their learning. According to Setlhodi (2019), learners obtain independence through different actions, of which collaborating with others is but one important factor. It is thus important to include CL strategies in a learning environment to enhance SDL. Learning takes place in association with others, but the control over learning is in the hands of the individual student, where they will have the freedom to set goals, initiate, evaluate, and control their own learning. Good communication skills are needed to report

on what was learned, argue and critically reflect on responses from peers, and communicate needs with educators and peers. According to Knowles (1984), the extent to which interaction between learners and their environment takes place influences the quality of learning. The ability to collaborate, to see peers as resources in the planning of own learning, and to give and receive help is part of a self-directed learner's locus of learning (Henschke 2016).

A self-directed learner is one who initiates new learning goals and is determined to reach those goals, motivated to learn new knowledge and skills, and in the process, self-directed learners view obstacles in their learning as challenges to overcome. They have high levels of self-discipline in terms of time management and a high degree of curiosity and independence (Guglielmino 1978). They also have the ability to evaluate and self-assess if learning needs are satisfied and learning goals reached (Knowles 1975).

Whilst designing the virtual excursion for first-year students, the authors specifically planned to incorporate learning strategies conducive to the enhancement of SDL.

☐ The apprenticeship of observation

In the introduction of this chapter, it was mentioned that the apprenticeship of observation holds the danger of student-teachers not understanding all the nuances of the complex teaching profession. This is confirmed by Howell (2012), who stated that:

> [*T*]he most persistent dilemma that remains a barrier to students of teaching becoming reflective knowers, thinkers, and doers, is their own narrow view of schools, children, and learning when they begin their teacher education programs. (p. 43)

Preservice and in-service teachers are confronted by three challenges posed by the apprenticeship of observation, according to Conner and Vary (2017). Firstly, their dominant impressions about teaching are built around their own likings, desires, and experiences regarding their teachers. This narrow view about teaching poses barriers for them to realise that different learners might have different learning needs from their own. Secondly, their ideas of best and poor teaching practices are limited to what they have witnessed and may place a limit on their opportunities to learn new teaching-learning models and methodologies. Thirdly, they only have a partial understanding of a teacher's work. In practice, this may imply that student-teachers do not have knowledge about the curriculum and how certain curriculum content will influence a teacher's decision to choose teaching-learning methods, activities, and assessment strategies. They will also not be aware how to be an inclusive practitioner by differentiating between the various needs of learners with regards to cognitive abilities, learning styles, and different cultural backgrounds.

Botha (2020) argues that:

These deeply rooted ways of thinking about teachers and what they do should be acknowledged, challenged, and disrupted, and preservice teachers should be supported in efforts to scrutinise their local knowledge and lived experience that constitute their dominant discourses about teaching and being a full-time teacher. (p. 50)

This tendency of student-teachers to emulate their teachers is understandable, because they observed their teachers for more than 14 000 hours during their school careers (Good & Lavigne 2018).

In Botha's (2020:61) article, she asked if university teacher training programmes sufficiently address the impact of the apprenticeship of observation on student-teachers' 'prior experiences and pre-conceptions of teaching'. In this regard, Moodie (2016:29) states that 'teacher education must play an important role in transmitting the professional discourse and having trainees critically reflect on their prior learning experience'.

▪ Pedagogy of play

All the activities engaged with during the excursion took place within the context of social constructivism, where learning firstly took place on a social plane. Students worked in small CL groups (of five), learning from the presenters and each other (cf. ch. 8). To optimise the learning in the social sphere, a pedagogy of play was adopted which formed a solid foundation on which the activities of the excursion were built. During the excursion, the student-teachers are in *Homo ludens* [the playing human] mode, a concept coined by Huizinga (1955). Some evidence of the value of play during learning include the notion that 'playful learning can be a powerful ally to develop students' intellectual, social, emotional, and physical abilities' (Mardell et al. 2016:2). Siviy (2016) emphasised in Leather, Harper and Obee's (2021:209) article about reasons to be playful in postsecondary education, the value that play can have on adolescents: 'there is evidence that engaging in play as adolescents leads to adults that are better able to navigate an ever-changing social, emotional, and cognitive landscape'.

A description of the activities used as the intervention during the excursion are summarised in Chapter 3.

▪ Methodology

▪ Research paradigm

Pragmatism as research paradigm can be used to cross-examine and evaluate research participants' ideas and beliefs with regards to their practical functioning (Cordeiro & Kelly 2019). Tashakkori and Teddlie (1998) argue that

a paradigm should be chosen that works best to answer the research question(s), whilst Kaushik and Walsh (2019) claim that pragmatism can be of value in social justice research. Johnson and Onwuegbuzie (2004:14) describe pragmatism as an 'attractive philosophical partner' when using mixed methods research. Pragmatism is therefore a suitable paradigm to use in the mixed methods research as reported in this chapter*.*

Research design

The research conveyed in this chapter adopted a mixed methods research design. Johnson and Onwuegbuzie (2004:15) contend that mixed methods research can complement traditional qualitative and quantitative research and argue that it can 'draw from both the strengths and minimize the weaknesses of a more traditional single approach'. Mentz and De Beer (2021) argue that the predominant quantitative research approach characterising SDL research falls short of providing 'thick descriptions' when evaluating SDL interventions.

Measuring instruments and data-gathering instruments

In this research, quantitative data were obtained from Cheng et al.'s (2010) SDLI, measuring perceptions of students about their SDL abilities. The SDLI was applied as a pre-intervention and post-intervention questionnaire. Qualitative data were obtained from the opinion polls from the participating student-teachers during the virtual excursion and from an open-ended questionnaire which students completed after the excursion. The population, sampling and participants will be discussed next.

Population, sampling and participants

Although it was compulsory for all the first-year BEd students (n = 2574) to partake in the virtual excursion, only the data obtained from those student-teachers who gave their voluntary informed consent (n = 1220) will be used in this chapter. Not all the students completed the SDLI (because research participation was voluntary, we did not attempt to persuade students to complete the questionnaires). For the SDLI, a total of 828 students completed the pre-intervention test, 132 students completed the post-intervention test, and 75 students could be used in the analyses of the results of both the pre-intervention and post-intervention test.

Data analysis

Data from the SDLI were analysed by the Statistical Consultation Services at the NWU. Reliability of the questionnaire was first determined where after a paired

sample test was done to determine if there are any practical significant differences between the pre-intervention and the post-intervention tests. Cohen's *d*-value and Hedges' correction was used for the interpretation of differences. A *d*-value of 0.2 can be seen as small, 0.5 as medium, and 0.8 as large.

Saldaña's (2009) process of coding was used to analyse the qualitative data (opinion polls, comments in the 'chat' function of Zoom, and open-ended questions). This process included the coding, categorisation, and formation of emerging themes from the transcribed qualitative data (Saldaña 2009). The findings of the qualitative data and quantitative data will be used to inform each other and presented in thick descriptions, utilising third-generation CHAT as a research lens. As we contrast two activity systems, namely the face-to-face excursions (2016–2019) and the virtual excursion (2021), we also draw on data that were collected during face-to-face excursions in the past.

■ Ethical considerations

In order to conduct this research, ethics approval was obtained from Edu-Rec, the ethics committee of the Faculty of Education, as well as from the NWU gatekeeper (the Registrar). All other ethical considerations such as confidentiality, anonymity, voluntary informed consent, and the option to withdraw without being disadvantaged were upheld. In Chapter 2, a comprehensive account of ethical considerations was provided. Having described the methodology for data analysis and those considerations that affected student participation therein, the Results section provides an analysis of motivation, experiences, and the insights and learning derived from participation.

■ Results

■ Quantitative results

The SDLI consists of 20 questions and can be divided into four categories: learning motivation (LM), planning and implementing (PI), self-monitoring (SM), and interpersonal communication (IC). Cheng et al. (2010:1155) define LM as the inner drive of the learner as well as external stimuli that drive the 'desire to learn and to take responsibility for one's learning', PI as 'the ability to independently set learning objectives, and to use appropriate learning strategies and resources in order to effectively achieve learning goals', SM as 'the ability to evaluate one's learning process and outcomes, and to make progress', and lastly, IC as 'the ability of learners to interact with others to promote their own learning'.

A high reliability for each of these factors was obtained and is shown in Table 5.3.

TABLE 5.3: Reliability of self-directed learning instrument per factor.

Factor	Questions	Reliability
LM	1–6	0.81
PI	7–12	0.85
SM	13–16	0.83
IC	17–20	0.74

Key: LM, learning motivation; PI, planning and implementing; SM, self-monitoring; IC, interpersonal communication.

In Table 5.4, descriptive statistics are given for each of the statements in the SDLI measured on the pre-test ($n = 828$) and the post-test ($n = 132$). When taking into account that a maximum score of 5 could be given to each statement, the mean scores all above 3.67 for the pre-test and most scores above 4 indicated a relatively high score given by students for their own SDL initially. Only three items have a score of 3.68 in the pre-test:

- S1: I know what I need to learn.
- S11: I am good at arranging and controlling my learning time.
- S19: I am able to express messages effectively in oral presentations.

After the intervention (virtual excursion) in which the students engaged, the mean scores for the post-test were even higher, with no mean score below 4.11. It is noteworthy that these students obtained a mean score of 4.92 for the item 'I strongly hope to constantly improve and excel in my learning'.

In Table 5.5, the mean scores and standard deviation for each category in the pre-intervention and post-intervention tests are provided, as well as Cohen's *d*-value and Hedges' correction. There was a practical significant difference of medium effect between pre-test and post-test for all categories, which indicated the possible effect of the virtual excursion on first-year students' perception of their SDL abilities. The biggest difference between pre-test and post-test scores can be seen with IC, which might be a result of the CL applied during the excursion.

■ Qualitative data

A number of themes emerged from the analysis of the qualitative data.

□ Theme 1: The virtual excursion provided student teachers with more nuanced understandings of the complexity of the teaching profession

During each of the 13 virtual (Education) excursions, an opinion poll was held in which the facilitators asked the students how prepared they are to start teaching, during Day 1 of the excursion. In Table 5.6, the feedback from 1220 students is shown. Only 7.62% of the students indicated that they felt under-prepared to go and teach. A surprising 7.3% of first-year students felt

TABLE 5.4: Mean and standard deviation for questions of the SDLI (pre-test and post-test).

Theme	Statement	Pre-test		Post-test	
		Mean	Standard deviation	Mean	Standard deviation
Learning motivation	S1: I know what I need to learn	3.68	0.97	4.51	0.72
	S2: Regardless of the results or effectiveness of my learning, I still like learning	4.23	0.90	4.75	0.53
	S3: I strongly hope to constantly improve and excel in my learning	4.68	0.72	4.92	0.30
	S4: My successes and failures inspire me to continue learning	4.53	0.80	4.82	0.53
	S5: I enjoy finding answers to questions	4.34	0.83	4.72	0.63
	S6: I will not give up learning because I face some difficulties	4.51	0.82	4.85	0.46
Planning and implementing	S7: I can proactively establish my learning goal	4.07	0.85	4.51	0.70
	S8: I know what learning strategies are appropriate for me in reaching my learning goals	4.02	0.94	4.49	0.76
	S9: I set the priorities of my learning	4.22	0.83	4.61	0.62
	S10: Whether in the classroom or on my own, I am able to follow my own plan of learning	4.09	0.88	4.41	0.72
	S11: I am good at arranging and controlling my learning time	3.68	0.99	4.11	0.87
	S12: I know how to find resources for my learning	3.90	0.92	4.25	0.82
Self-monitoring	S13: I can connect new knowledge with my own personal experiences	4.13	0.86	4.56	0.62
	S14: I understand the strengths and weaknesses of my learning	4.17	0.87	4.54	0.67
	S15: I can monitor my learning progress	4.00	0.91	4.42	0.75
	S16: I can evaluate on my own my learning outcomes	3.93	0.86	4.37	0.78
Interpersonal communication	S17: My interaction with others helps me plan for further learning	3.98	0.98	4.42	0.84
	S18: I would like to learn the language and culture of those whom I frequently interact with	4.20	0.96	4.67	0.65
	S19: I am able to express messages effectively in oral presentations	3.68	1.03	4.20	0.85
	S20 I am able to communicate messages effectively in writing	4.20	0.85	4.61	0.68

Key: SDLI, self-directed learning instrument.

completely prepared, 44.67% felt mostly prepared, and 40.41% felt slightly under-prepared. These findings are also represented in the bar graph in Figure 5.1. In line with our previous argument about the apprenticeship of observation, first-year education students clearly have a false sense of their preparedness to meet the demands of the complex profession.

The qualitative data show that the virtual online excursion did change many students' views about the complexity of the teaching profession. (From the students who completed the open-ended questionnaire, 80% indicated a

TABLE 5.5: Difference between pre-tests and post-tests.

Category	Mean (pre)	Mean (post)	*n*	STD (pre)	STD (post)	*p*	Cohen d-value	Hedges correction
LM	4.43	4.75	75	0.54	0.32	0.000	0.53	0.54
PI	4.13	4.37	75	0.66	0.58	0.001	0.61	0.62
SM	4.16	4.43	75	0.63	0.60	0.000	0.62	0.62
IC	4.14	4.46	75	0.72	0.52	0.000	0.73	0.73

Key: LM, learning motivation; PI, planning and implementing; SM, self-monitoring; IC, interpersonal communication.

TABLE 5.6: Responses from students on their preparedness to teach.

Preparedness	EXC B	EXC C	EXC D	EXC E	EXC F	EXC G	EXC H	EXC I	EXC J	EXC K	EXC L	EXC M	Total (%)
Completely prepared	10	2	5	8	12	8	3	10	5	14	3	9	**89 (7.30)**
Mostly prepared	72	47	42	45	60	56	48	44	30	36	25	40	**545 (44.67)**
Slightly prepared	65	46	36	43	58	48	37	31	42	32	23	32	**493 (40.41)**
Under-prepared	9	10	10	5	13	9	9	11	5	4	1	7	**93 (7.62)**
Total	**156**	**105**	**93**	**101**	**143**	**121**	**97**	**96**	**82**	**86**	**52**	**88**	**1220 (100)**

Key: EXC, excursion.

more nuanced understanding of the complexity of the teaching profession.) Students realised during the excursion that they had a false perception of their own preparedness to go and teach, and that realisation motivated students to set their own learning goals with regard to their own professional development (refer to Theme 2). Some of the students' comments were:

'A goal is to learn more about my chosen profession, what I need to be ready for, which aspects of myself I need to work through in order to be the best teacher.' (BEd student, unknown gender, 15 October 2021)

'The excursion showed me that I need to do more research on ideas to use in the classroom to teach the children. It also showed me that I'm not yet ready to start to teach children.' (BEd student, female, 15 October 2021)

'I learned that I do not know everything about teaching. There is still a lot to be learned and […] I will be a lifelong learner even as a teacher. I learnt that the chalk-and-talk method used by my teachers everyday was wrong to do continuously, as we had no cooperative learning in school. I learnt that you should respect other's opinions and take into consideration what they say.' (BEd student, gender unknown, 15 October 2021)

☐ Theme 2: The excursion prompted students to set learning goals for themselves in terms of their professional development

A few predominant learning goals that emerged from the data are: communication skills (55% of students listed communication skills as learning goal), the development of ICT skills as a learning goal (35%), interactive
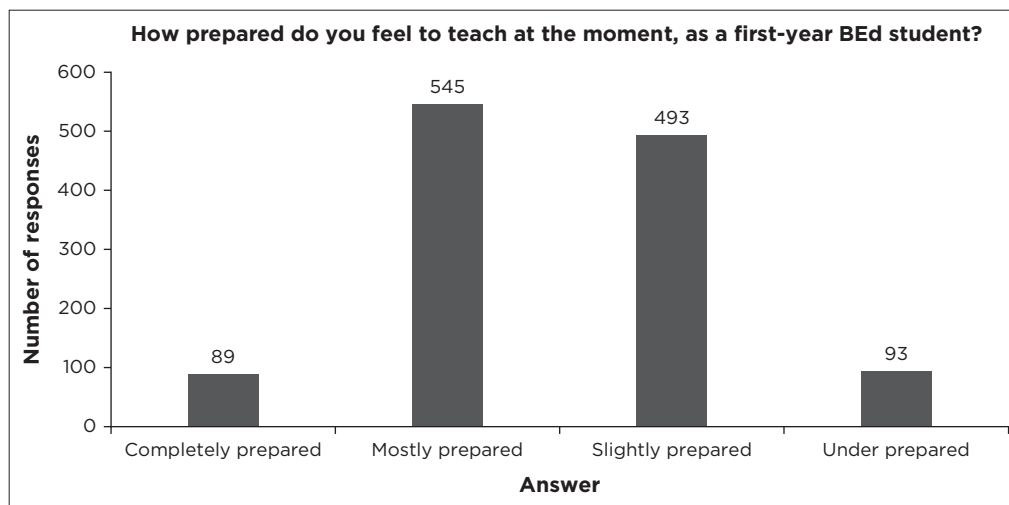
FIGURE 5.1: First-year students' perceptions of their readiness to teach.

teaching and engaging pedagogies as learning goal (30%) and time management (15%). Other learning goals identified by students were developing social skills and teamwork (5%), working on reading skills (3%), creative thinking (3%) and working on an own professional identity as a teacher (3%).

☐ *Communication skills*

The predominant learning goal set by students (55%) is communication skills. A few quotations from students are provided below as illustration of responses:

'I need to set goals to develop communication skills. I am not a very talkative person, would rather let someone else do the talking. During this excursion I learned how to use my voice and that I can share my opinion without being judged.' (BEd student, female, 15 October 2021)

Similar responses were obtained from respondents 8, 13, 20 and 65.

Communication within the multi-lingual NWU context was also considered in the students' feedback on learning goals:

'I want to work on my communication skills, especially in English, more specifically giving instructions in English. Afrikaans is my home language, and sometimes my English-airtime depletes when giving instructions, and I switch over to Afrikaans.' (BEd student, female, 15 October 2021)

'Communication skills, because it was my first time talking with people from different campuses and speaking other languages.' (BEd student, unknown gender, 15 October 2021)

Similar responses were obtained from, amongst others, Respondent 23.

The fact that the virtual excursions necessitated communication by all students on the Zoom platform created nervous tension in students (as there were up to 250 students registered per excursion) and a realisation that public speaking would be a worthwhile learning goal to pursue:

'I decided that I desperately need to work on my public speaking. Speaking in public is a very big part of teaching, seeing as you'll have parent-teacher meetings and prize givings. You need to be confident in this aspect.' (BEd student, female, 15 October 2021)

Similar responses were also obtained from other students, for example, Respondent 48, who stated:

'The only learning goal I set for myself was to work on my communication skills. This is an area that I have trouble in, as I tend to get overwhelmed when speaking in front of people. I got anxious from the possibility of speaking in front of hundreds of students and two accomplished professors, which made me upset. I decided that I have to work on this weakness so that I may one day turn communication into my strength.' (BEd student, unknown gender, 15 October 2021)

Another nuance in terms of communication skills is the realisation that it is fine to correct other people or to be corrected:

'Working on communication skills, because I'm one person who does not like group work because I find it hard to voice up my voice; I prefer being on the back and not communicate. But this virtual excursion has taught me no one is perfect and being corrected doesn't always have to be seen as malicious.' (BEd student, female, 15 October 2021)

☐ *Information and communications technology skills*

A second learning goal set by 35% of students was to improve their ICT skills. Most students mentioned the development of generic ICT skills, for example:

'Computer skills – I grew to understand that we are moving towards the e-learning, which according to my understanding needs a teacher who is technologically literate in order to know and understand the future generations we going to be teaching.' (BEd student, female, 15 October 2021)

Similar responses were also received by many other students, for example, participant 46:

'Computer was challenging because sometimes it requires certain computer knowledge that I don't know.'

However, there were also specific aspects mentioned related to ICTs, such as using Google Docs or the Zoom platform:

'I made a goal to learn and understand how Google Docs works, as I have never used it before, and I did learn quite a bit about the program.' (BEd student, gender unknown, 15 October 2021)

'I learnt that we have to use online platforms like Zoom and improve my computer skills. As a challenge for myself, I offered to be the materials manager for my group. I don't know much about computers, but I learnt during that time.' (BEd student, gender unknown, 15 October 2021)

☐ *Interactive teaching and learning methods (e.g. cooperative learning)*

A third learning goal set by several students (30%) was to learn more about interactive teaching and learning methods:

'I researched more learning strategies and how to be a cooperative learning teacher.' (BEd student, gender unknown, 15 October 2021)

'Learn more interactive teaching activities and more about special needs learners in the class so that I can provide more stimulating lessons for learners and help special needs learners achieve their goals as well in the classroom.' (BEd student, gender unknown, 15 October 2021)

'I decided to read more about ways or methods you can use in your classroom to enhance learners learning process in a fun way. I major in Languages and I don't really know how to make a lesson more interesting for students! I want them to enjoy my class and to enjoy learning languages!' (BEd student, female, 15 October 2021)

☐ *Time management*

A fourth dominant learning goal that students set for themselves (15% of student responses) was to improve their time management skills.

'I formulate some learning goals and therefore I work on my time management. I was falling behind with some of my work, but with a daily schedule I can stay on track.' (BEd student, male, 15 October 2021)

Similar feedback was also received from, amongst others, respondents 34 and 57.

☐ Theme 3: The excursion sensitised students towards taking responsibility for their own learning

The open-ended questionnaire included an item on how the excursion assisted students in taking responsibility for their own learning. Here are some of the students' responses that clearly indicate that the excursions succeeded in sensitising students towards taking responsibility for their own learning:

'I cannot only depend on the content prescribed by the subject. It is my responsibility to further my knowledge by reading more. The excursion taught me that I must be able to use what I have with creativity and innovation. The world is your classroom; what you learn is up to you.' (BEd student, female, 15 October 2021)

'I was encouraged. Reality of me being responsible for my own future success kicked in.' (BEd student, female, 15 October 2021)

Similar responses were provided by respondents 21, 43 and 48.

Several students realised that being self-motivated and self-disciplined are keys to success:

'It empowered me as I saw how one cannot rely on other people when it comes to one's education! There is only one person who is in control and is trustworthy of your learning and education and that is yourself. One needs to be motivated and disciplined within themselves and not on rely on others.' (BEd student, gender unknown, 15 October 2021)

The role of reflection was also highlighted by some students:

'The excursion had a huge impact, positive impact in me taking responsibility in my own learning. It encouraged me to set my own goals and reflect in my own learning. Ask for help, make use of the term cooperation.' (BEd student, female, 15 October 2021)

☐ Theme 4: The data show that the virtual excursion assisted students in realising the value of learning in diverse groups, and to develop a sense of belonging as a North-West University student

An interesting finding is that developing a sense of belonging and an identity as an NWU student was particularly enhanced by the virtual excursion in the distance education students (students registered in the ODL Programme), and to a lesser extent in the students registered on the three campuses for contact tuition. Many students, after the excursion, still saw themselves as students from a particular campus, that is, Potchefstroom, Vanderbijlpark, or Mahikeng, although the excursion did challenge this perception as well. However, for the ODL students, the engagement with contact tuition students meant a great deal:

'Being a UODL student, it's easy to feel disconnected from the student life, but after the excursion I feel part of the NWU Family.' (BEd ODL student, unknown gender, 15 October 2021)

This aspect is addressed in more detail in Chapter 2.

■ A finer analysis of the data through a Cultural-Historical Activity Theory lens: Comparing the face-to-face excursions with the virtual online excursion

In this analysis, we regard the excursion as the activity system. In the third-generation CHAT tradition (Engeström 1987; Mentz & De Beer 2019), we juxtapose two activity systems, namely the face-to-face excursion (2016–2019) as an activity system on the left and the virtual online excursion (2021) on the right (Figure 5.2).

Key:
T – Tools
S – Subject
R – Rules
C – Community
D – Division of labour
O – Object/objective

Engaging pedagogies group-work dramatisation of case studies navigating the social space
T

Cooperative learning problem-based learning syncrynous learning/ withitness
T

Contradiction of control

Development of SDL skills, and nuanced understanding of the profession with a sense of belonging.

1st-year student-teacher **S**

O **O**

S 1st-year student-teacher

Face-to-face excursion

Virtual excursion

R **C** **D** **D** **C** **R**

Course outcomes
• MRTEQ social constructivist principles
• Principles of SDL

• Student-teachers
• Facilitators

Teachers as:
• Facilitators of learning
• Reflective practitioners agents of change
• Self-directed learner

Teachers as:
• Learning facilitators
• Agent of learning
• Cooperative learning participant
• Self-directed learner

• Teacher(s)
• School
• Management
• Learners
• Parents

Course outcomes
• MRTEQ social constructivist requirements
• SDL principles
• CL principles
• PBL principles

Key: MRTEQ, Minimum Requirements for Teacher Education Qualifications; SDL, self-directed learning; CL, cooperative learning; PBL, problem-based learning.

FIGURE 5.2: Using the third-generation Cultural-Historical Activity Theory as a research lens to juxtapose the face-to-face excursion (activity system on the left) with the virtual online excursion (activity system on the right).

In both these activity systems, the subject (S) is the first-year student-teacher and the object (O) refers to the achieved outcomes of the excursion. Both the face-to-face and the virtual online excursions had as goals to promote SDL, a sense of belonging, and more nuanced views of the profession. The data (as will be discussed) show that these goals were obtained by both activity systems but to varying degrees. Although the tools (T) in both activities are embedded in social constructivist principles and utilising a pedagogy of play, there were slight nuanced differences. Whereas groupwork was done during the face-to-face excursions, we specifically refined the groupwork during the virtual excursions to meet all the elements of CL (Johnson & Johnson 1994) – as discussed in Chapter 8. For example, students were assigned specific roles during the CL activities (which were not pertinent

during face-to-face excursions). Although elements of PBL were present during the face-to-face excursions, the entire virtual excursion (activity system on the right) was built around an ill-structured problem described more fulsomely in Chapter 7. Students were also expected to work for more extended periods of time on the assessment task (cf. ch. 10) during the virtual excursion.

The face-to-face excursions meant that students had to navigate the physical social space for three days. In this social space, conflict often arises, and De Beer and Henning (2011) describe these tensions as 'dramatical collisions'. The latter authors show that such 'dramatical collisions' could be powerful drivers of learning. It was challenging to design and integrate this aspect into the virtual excursion programme. Similar rules governed the activity systems, although the different elements of CL and PBL were specific design principles in the case of the virtual excursion. The communication (C) includes the facilitators (both teacher educators and student facilitators) and the first-year student-teachers. The division of labour (D) refers to the different roles that the student teacher needs to 'master', for example, being a self-directed learner, a facilitator of learning, or an inclusive teacher.

The value of having two activity systems as the minimal unit of analysis makes comparisons possible, especially in terms of the 'object' of the activity systems, which is often surrounded by complexity (Mentz & De Beer 2019:61). McNeil (2013) speaks of the 'contradiction of control'. In the case of these two activity systems, as can be seen in Figure 5.2, there is minimal contradiction of control, as both the activity systems succeeded in enhancing the object. However, there are subtle differences in the achievement of the excursion goals which will also be described. For example, evidence of enhanced SDL was seen in the virtual excursion activity system.

In Table 5.7, we compare the descriptive statistics for the face-to-face excursion (2019) with the virtual excursion (2021), in terms of the four domains in the SDLI.

In 2019, only post-intervention SDLI values were collected (no pre-test was administered). The last column in Table 5.5 compares the post-intervention SDLI values of the students. It is clear that the virtual excursion was more supportive of developing SDL skills in comparison to face-to-face student excursions. Developing communication skills emerged in the qualitative analysis as the most predominant learning goal that students set themselves during the virtual excursions. This shows that many more demands were placed on students in terms of effective communication during the virtual excursions. We realise that students, during the face-to-face excursions, could 'disappear in the larger group', without showing the same level of engagement as during the virtual excursion. In the CL groups, the roles assigned to students

TABLE 5.7: Students' views of their self-directed learning, as captured during (a) the face-to-face excursion in 2019 and (b) the virtual excursion (2021).

Description (SDLI domain)	Face-to-face excursion *mean*	Virtual excursion		Difference in *mean* values: Face-to-face and (post-) virtual excursions
		Pre-intervention *mean*	Post-intervention *mean*	
Learning motivation	4.52	4.33	4.75	+0.23
Planning and implementation	4.00	4.0	4.40	+0.40
Self-monitoring	4.10	4.06	4.47	+0.37
Interpersonal communication	Cronbach value was too low for further analysis	4.02	4.49	–

Key: SDLI, self-directed learning instrument.

changed with each activity, and every student (for example) had the opportunity to act as the 'communication specialist' and had to provide feedback during the plenary sessions. During the face-to-face excursions (with 400 students in one big hall), it was much easier for a shy student to not actively engage in discussions.

Regarding the experience of a 'sense of belonging', the advantage of the virtual excursions is that all the ODL students were also expected to participate. Because of the high costs involved in face-to-face excursions (providing accommodation and meals to all students), only a limited number of ODL students participated. The data showed that the ODL students appreciated the opportunity to engage with contact tuition students during the virtual excursions and that it enhances the ODL students' sense of belonging and identity as NWU students. This suggests that in future, the online modality lends itself well to enabling the participation of groups of students not associated with the contact modality, creating thus a more integrated and inclusive experience for all the students participating.

On the other hand, we did not experience the 'dramatical collisions' during the virtual excursions to the same extent that characterised many of the face-to-face excursions.[4] Students were not exposed (to the same extent) during the virtual online event to the stressful situation of getting along with diverse students on a camp terrain for three days, where irritations were experienced on various levels – student conduct in shared ablution facilities or behaviour in the dining room, to provide but two contexts. Although the online programme did address issues of diversity and inclusion, students were not confronted with their own biases to the same extent as they would during face-to-face excursions. Cleveland-Innes and Campbell (2012) have shown that emotional presence is definitely part of the online learning space, and the

4. In Chapter 4, it is shown that such tensions did arise in some of the break-away rooms.

data speak of an emotional involvement during the virtual excursion. For example, one student commented:

'The group that I was assigned to the day before the excursion was problematic. The members did not participate in group discussions during the excursion and relied on me to do everything that had to be done. I overcame this problem by switching to a new group with the permission of the lecturer.' (BEd student, unknown gender, 15 October 2021)

In the online environment, it is easier to avoid people than during face-to-face excursions. This is an aspect that should be further researched.

Mentz and De Beer (2019) make it clear that CHAT can be used as a flexible metatheoretical framework that researchers can use to interpret data from complex settings and to identify factors that either impede or support the attainment of the object. The data show that both the activity systems have factors that aid and obstruct the realisation of the excursion goals. In both activity systems, negative tensions are at work that impact the object. However, the data also highlight that both face-to-face and virtual excursions have affordances to enrich the professional development of student-teachers and enhance SDL.

■ Conclusion

The findings clearly show that well-designed virtual, online learning experiences – embedded in problem-based and CL approaches – hold much potential to enhance students' SDL. The virtual excursion seems to be more effective in enhancing SDL than the traditional face-to-face excursions. However, the online learning space does not create the same level of discomfort as the face-to-face excursion, although the researchers in Chapter 4 report on some tensions in the Zoom break-away rooms. De Beer, Petersen, and Dunbar-Krige (2012) explain that such a 'zone of discomfort' is actually a good learning space, as it exposes the student to his or her own biases and prejudice. For students attending face-to-face excursions, this discomfort already starts on the bus, travelling to the camp terrain:

At the commencement of this journey, students are already placed in a situation fraught with tension as many of them have not had to share a communal space for travelling before. A number of tensions arise during the five-hour bus ride, when they share a very confined space in which multiple languages are spoken and different genres of music compete (De Beer et al. 2012:98). The question arises how the virtual learning space could make such 'discomfort' a stronger design feature.

It is recommended that the NWU engages in a hybrid of both face-to-face and virtual excursions, as clearly both versions of excursions hold affordances. For contact campus students, face-to-face excursions might remain the

preferred mode in a post-COVID-19 environment, but virtual excursions will make it possible for ODL students to also gain from the excursion learning experience.

■ Acknowledgements

Chapter 6

Exploring virtual excursions for self-directed learning: A systematic literature review

Jako Olivier
Research Unit Self-Directed Learning,
Faculty of Education, North-West University,
Mahikeng, South Africa

Nothile A.T. Kunene
Research Unit Self-Directed Learning,
Faculty of Education, North-West University,
Mahikeng, South Africa

■ Abstract

Virtual excursions, as an iteration of online-based learning and teaching activities, are become more popular and in this context, SDL could be regarded as an important aspect of the learning process. In this chapter, we aim to explore the overall trends and characteristics from published works on online virtual excursions in terms of SDL from the last 20 years. To this end, this chapter involves a systematic literature review conducted with a corpus of published works carefully screened based on set inclusion criteria related to virtual excursions and SDL. The process then further involved an inductive

thematic and structural analysis of the publications. From this research, an overview is presented on thematic and methodological aspects of discourses on virtual excursions, but the chapter also specifically considers how engagement with SDL happens on such platforms. It is evident that the research relating to SDL regarding virtual excursions is fairly limited and that many opportunities exist for future work in this context. The chapter concludes by presenting guidelines and research lacunae, based on the reviewed publications, for setting up virtual excursions that could promote SDL as well as identifying appropriate learning strategies within this context.

■ Introduction

The focus of this chapter is the concept of virtual excursions and how the implementation or use thereof relates to or supports SDL as is evident in identified publications from the last 20 years. The term *virtual excursion* refers to an excursion that is presented virtually and hence through a specific online platform. The term 'e-excursion' (Barra, Gordillo & Quemada 2014) or e-excursion is also used in some literature, and there are also intersections with the literature of virtual excursions and virtual reality excursions (Fung et al. 2019); however, for the purposes of this chapter and for consistency with the rest of the publication, *virtual excursion* is used.

In order to provide an overview of the general trends of publications on virtual excursions and its impact and role in terms of SDL, a systematic literature review (Boell & Cecez-Kecmanovic 2015; Okoli 2015; Xiao & Watson 2019) was undertaken. This chapter briefly unpacks the concepts of virtual excursions and SDL after which a compiled corpus of published works related to virtual excursions are analysed in terms of common themes found in these publications and specifically with a focus on SDL and elements thereof. The section 'Problem statement and research question' clarifies the context and the main question guiding this research.

■ Problem statement and research question

There is an increased need for online and even virtual learning spaces because of gradual shifts towards embracing technology as well as practical considerations around safe and flexible online education within the context of the COVID-19 pandemic (cf. ch. 2 and ch. 13). Within this context, one way of handling excursions is by moving them from a face-to-face modality to a virtual one. However, in this regard, there has been limited research. Moreover, Denysenko et al. (2020) make the following observation:

> There are virtually no studies in the theory and methodology of professional education that highlight the methodological aspects of preparing students for virtual tours in local educational settings. (p. 2)

Consequently, this systematic review is part of the process of taking stock in terms of what has been done research-wise with regard to virtual excursions and, importantly, identifying relevant lacunae.

This chapter was driven by the following research questions which are addressed by means of a systematic literature review: what are the overall trends and characteristics of online virtual excursions in terms of SDL from published works of the last 20 years?

■ Literature review

■ Virtual excursions

The concept of virtual excursions has been unpacked in detail in Chapter 1 and Chapter 3. But it was essential in this chapter to draw parameters around how the concept was understood in terms of the conducted systematic literature review. Typically, virtual excursions involve combinations of different websites and applications within a cohesive and focused online set of activities which can be delivered or linked through a single platform. Virtual excursions may also contain an integration of different learning objects, resources, cyber infrastructures, and selected external services (Barra et al. 2014).

A distinction is made by Condon (2013:26) in terms of virtual environments versus virtual excursions where the environments 'take place in real-time', whilst according to that author an excursion could be handled asynchronously. For this chapter, this distinction was not made as in some cases; the virtual excursions from the publications in the corpus – as it is also within this book – were conducted in real-time. Moreover, it is evident from the literature that different online excursions can be considered on a continuum of virtual, augmented, and mixed reality excursions (Denysenko et al. 2020).

Virtual excursions also draw on the extensive scholarship on in-person excursions as well as the so-called field trip pedagogy. In the educational literature, field trips or excursions refer to instructional trips or journeys with a specific educational purpose (Behrendt & Franklin 2014). Rebar (2012) warns against missed opportunities in excursions when teachers are not prepared and informed about how to effectively make use of resources within the excursion. The importance of excursions or field trips is explained by Behrendt and Franklin (2014):

> Field trips offer an opportunity to motivate and connect students to appreciate and understand classroom concepts, which increase a student's knowledge foundation, promoting further learning and higher-level thinking strategies. (p. 242)

The need for planning and interaction on the side of the teacher is also highlighted by Behrendt and Franklin (2014), whilst they also emphasise that students should have sufficient freedom to experience the field trip independently. It is specifically

in this sense that affordances around SDL can be considered. Consequently, a very important theoretical concept for this chapter is SDL.

■ Self-directed learning

☐ Background

Researchers have regarded SDL as one of the growing research areas traced back to andragogy education and learning (Brockett & Hiemstra 2018:19; Hiemstra & Brockett 2012:15; Olivier & Wentworth 2021:18). For this chapter, SDL is defined as follows (Knowles 1975):

> A process in which individuals take the initiative, with or without the help of others, in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, choosing and implementing appropriate learning strategies and evaluating learning outcomes. (p. 18)

In this milieu, SDL captures the essence of inculcating interest and the urge in young people (students) in taking charge of their learning (Olivier & Wentworth 2021:17). From this perspective, students competently set their own aims, identify specific material or even humans who can act as resources, choosing appropriate types of learning strategies and eventually evaluating their learning progress.

Self-directed learning is believed to be underpinned by the constructivism paradigm, more grounded in the socio-cultural models, crafting in independence and active inquiry (Van Deur 2017:10). There is a phenomenal growth in the scholarship of SDL, as noted through the recent research in the field (cf. ed. De Beer 2019; eds. De Beer, Petersen & Van Vuuren 2020; eds. Mentz & Bailey 2020; eds. Mentz, De Beer & Bailey 2019; eds. Mentz, Laubscher & Olivier 2021; eds. Mentz & Lubbe 2021; eds. Mentz & Oosthuizen 2016; ed. Olivier 2020a).

☐ Characteristics of self-directed learning

Researchers have presented different influential models to better understand SDL within the context of educational learning such as Long's SDL instructional model, Candy's SDL model, Brockett and Hiemstra's personal responsibility orientation model, Garrison's model and Oswalt's model (eds. Mentz et al. 2019:18). In this context, SDL components, issues of the learning situation (environment), components of learning, and the students' attributes in the process are highlighted. Bosch, Mentz, and Goede (2019:2) proposed models focused on describing and operationalising SDL, whilst Garrison (1997:21) suggested a model that 'integrates self-management (contextual control), self-monitoring (cognitive responsibility), and motivational (entering and task) elements'. It is noted that motivation, which also propels engagement, emanates from the self-determination theory (SDT). This in turn builds on

traditional conjecture whilst informing its classroom applications in producing students who consider themselves to work with a sense of competence, relatedness, and autonomy in their learning activities (Reeve 2012:149). According to Reeve, SDT is a macro-theory of motivation that enhances a better understanding of motivation in researchers and practitioners.

It is essential for learning to relate to real-life and authentic contexts relevant to the students. Merriam and Bierema (2014:108) note the importance of experiential learning and how it relates to 'the use of certain instructional strategies and programs familiar to adult educators that are designed to make learning as authentic and like real life as possible'. The advantages of real-life tasks for SDL are further highlighted by Bolhuis and Voeten (2001) as well as Van Merriënboer and Sluijsmans (2009), while Boyer et al. (2014) showed how students appreciated real-world application within the context of SDL.

Furthermore, Bosch et al. (2019:25–27) identified distinct strategies to enhance SDL such as PBL, active learning, process-oriented learning, and cooperative learning. Fischer (2013:22) observes in terms of active learning that it 'happens when learners are self-directed to learn for themselves by means of their need to solve authentic or personally meaningful problems'. Moreover, six SDL foundational developmental steps have been suggested for students (Robinson & Persky 2020):

- developing goals for study
- outlining how learners will know when they have achieved their goals through assessment
- identify the structure and sequence of activities
- layout a timeline to complete activities
- identify resources to achieve each goal
- locate a mentor or faculty member to provide feedback on the plan. (p. 293)

It is highlighted that students develop SDL-requisite skills that will enhance their development as independent and lifelong learners (self-improvement) (Williamson 2007:66). Moreover, SDL students become proactive whilst taking initiative of their own learning, propelled by meaningful and purposeful motivation. The researchers used some components from the SDL characteristics in the analysis of the selected sources in the corpus.

■ Self-directed learning and blended learning for virtual excursions

It is a requisite that SDL students must engage with massive open online learning courses (MOOCs) to be successful in their educational settings or environments (Zhu, Bonk & Doo 2020:2073). With that said, it calls for instructors to facilitate, guide, and support students efficiently in the

development and promotion of self-monitoring skills of MOOC students, who can be adversely affected by the inexperienced responsibilities in the learning environment. As an online learning environment, MOOC offers different types of online learning resources that enhance research on SDL to be operational and impactful on the students' online learning (Zhu et al. 2020:2077). A highly self-directed student was better defined by Guglielmino (1978) by highlighting the students' attributes:

> [O]ne who exhibits initiative, independence, and persistence in learning; one who accepts responsibility for his or her own learning and views problems as challenges, not obstacles; one who is capable of self-discipline and has a high degree of curiosity; one who has a strong desire to learn or change and is self-confident; one who is able to use basic study skills, organise his or her own time, set an appropriate pace for learning, and develop a plan for completing work; one who enjoys learning and has a tendency to be goal-oriented. (p. 73)

Sze-Yeng and Hussian (2010) attribute the skill of autonomy as a requisite for SDL students in managing their own learning process. Hence, students are driven by the motivation to engage and perceive themselves 'as the source of [their] own actions and decisions as a responsibility towards one's own lifelong learning' (Sze-Yeng & Hussain 2010:1913).

Self-directed learning was prominent through learning tasks that supported constructivist collaboration in both face-to-face and virtual learning spaces such as the virtual excursions, hence awarding the two environmental experiences as a blended learning environment (Sze-Yeng & Hussian 2010:1913). Online technology can enhance the facilitation of SDL as students interact with peers (p. 1916) through virtual excursions. According to Garrison (1992), in SDL, knowledge and meaning are not passive but constructed in collaboration and interdependent with peers and facilitators (instructors). Uz and Uzun (2018:877) proposed that blended learning or instruction yielded better results or effectiveness as compared to traditional instruction regarding the development of self-regulated and SDL skills. Blended learning is conceptualised as a concept 'combination of traditional, face-to-face instruction with e-learning' (Digolo, Andang'o & Katuli 2011:137). Furthermore, Bosch, Laubscher, and Olivier (2020:52) conceptualised blended learning as a 'combination of face-to-face and online modalities or functioning at the level of instructional multimodality'. The blended learning perspective captures the essence of engagement and interaction of students with technology in real-life contexts, including:

- Flexibility and the freedom to learn anytime, anywhere.
- It is student-centred, which includes some level of control over the pace of their learning. Difficult concepts can be reviewed as often as necessary.
- More engaging content that they can create and use their own initiative and networks to shape, such as collaborating with other students from different schools.

- The opportunity to engage and draw on expertise that would otherwise not be available to them without costly travel, such as in virtual conferencing, virtual excursions, or culturally significant landmarks (Crawford 2017:198).

Furthermore, the authors highlighted the need to create virtual learning environments (VLEs) as they open opportunities for students who are not able to access campus facilities to maximise their learning competence. Digolo et al. (2011) define virtual education as:

> Instruction in a learning environment where teacher and student are separated by time or space, or both, and the teacher provides course content through course management applications, the Internet, multimedia resources and videoconferencing among other technologies. (p. 137)

Blended learning provides a learning environment that envelops self-regulated learning as well as SDL (Uz & Uzun 2018:877), whilst self-regulated learning embraces the cognitive and metacognitive concepts and functions rooted in psychology (Pilling-Cormick & Garrison 2007:23). Furthermore, Pilling-Cormick and Garrison (2007) postulate that:

> Metacognition involves the knowledge of one's own thinking, that is, it entails reflecting on one's thoughts and understanding the process of thinking. Learners need an awareness and understanding of cognitive processes before they can expect to successfully regulate their learning activities. (p. 23)

Hence, interaction and social activity are vital to unearth cognitive and metacognitive strategies. Within the premises of SDL, instructors should support students by giving feedback to the students as they engage in the self-monitoring skills.

Multimodal learning relates to 'the mixing of different modes within an educational context' (Seeletso & Olivier 2020:169), using chat text, audio, and videos, either face-to-face or online. Furthermore, multimodal learning can be equated to 'the integration of different classroom activities and content, provided through different technologies' (Olivier 2020b:3) and can be taken in any of the different levels: multimodal communication, multimodal learning or teaching, multimodal delivery, and individual multimodality.

■ Methodology

■ Research design and paradigm

This systematic literature review (Boell & Cecez-Kecmanovic 2015; Okoli 2015; Xiao & Watson 2019) was underpinned by an interpretivist research paradigm. Our approach to the systematic review was interpretivist as we attempted to 'understand the subjective world of human experience' (Cohen, Manion & Morrison 2011:17) as was evidenced through identified publications. Consequently, we also attempted not to impose any external form on the data

but rather tried to gain an understanding of the views possessed by the original authors. In this regard, the approach was qualitative as the published artefacts were analysed inductively. We were also cognisant of the limitations and challenges that may be encountered with systematic literature reviews (Boell & Cecez-Kecmanovic 2015). A systematic literature review involves a synthesis of published research based on a structured protocol (Cohen et al. 2011). It was important to consider throughout the research process that this systematic literature review, in Okoli's (2015) words, had to:

> Be systematic in following a methodological approach, explicit in explaining the procedures by which it was conducted, comprehensive in its scope of including all relevant material, and, hence, reproducible by others who would follow the same approach in reviewing the topic. (p. 880)

Furthermore, Xiao and Watson (2019) describe the different types of systematic literature reviews, and the method followed in this chapter included elements of a metanarrative review. This approach was selected because of the fact that a limited number of publications ultimately either adhered to the inclusion criteria or had substantial information about virtual excursions. Additionally, not all the studies included in this corpus had consistent and comparable empirical designs, which made grouping and consistent analysis difficult. Furthermore, this is explored further in terms of sampling techniques and the data collection and organisation.

■ Sampling and data collection

The sampling for this research involved systematic searches (Xiao & Watson 2019) through a number of carefully selected online databases. The choice of database was determined by the databases containing research relevant to the wider educational discipline. In consideration of the chosen research aim, it was decided to use 'virtual excursion' or 'virtual excursions' as well as 'self-directed learning' as keywords, and any source that included these terms anywhere in the text was included in the analysis corpus. After very few appropriate results were found for this combination, only 'virtual excursion' or 'virtual excursions' were used, as in the instances where both items were included in publications, they did not provide any analysable or relevant content.

A corpus of 776 publications were derived through searches on Google Scholar, Academic Search Complete, Education Resource Information Center, Scopus, Web of Science, and African Journals (Sabinet). Some sources had to be eliminated as only conference abstracts and not full papers were available.

The following Preferred Reporting Items for Systematic Reviews and Meta-Analyses study flow diagram (Čablová et al. 2017) in Figure 6.1 illustrates the source selection process for this research.
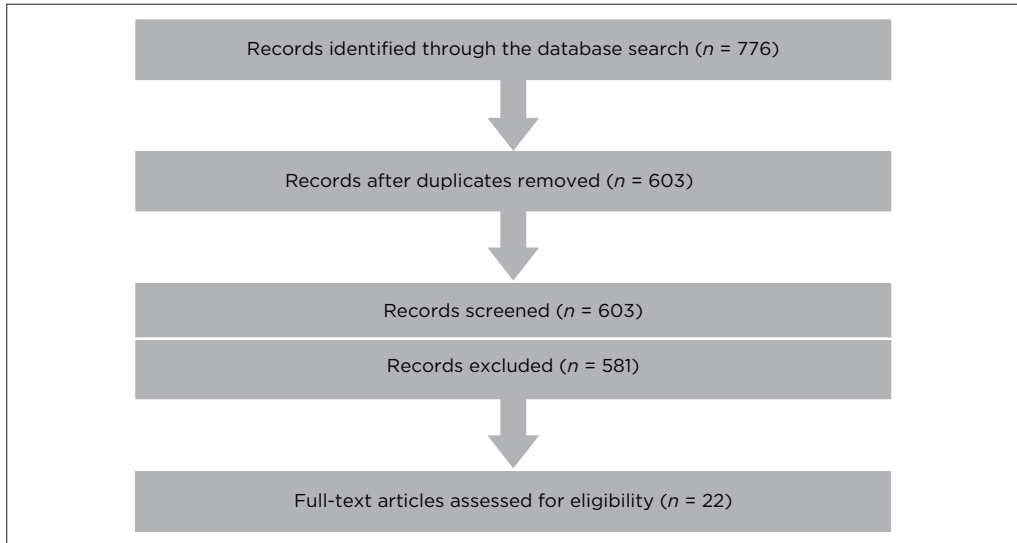
FIGURE 6.1: Preferred Reporting Items for Systematic Reviews and Meta-Analyses source selection flow diagram.

Two important aspects of the source selection process were extracting the data and appraising the quality (Okoli 2015). From this process, many sources were eliminated. The low number of relevant publications also aligns with the view from the literature that very few empirical studies have been done on virtual excursions (Thönnessen & Budke 2021).

◼ Data analysis

The data analysis in this chapter involved a critical and in-depth systematic review of selected articles by means of an inductive content analysis. This analysis process is also called a synthesis in the literature (Okoli 2015), where both quantitative and qualitative aspects are extracted from the analysis of the identified publications. For this chapter, the analysis involved two distinct phases: firstly, the aim was to get an overview of the trends regarding virtual excursions and secondly, probing implications for SDL. To ensure trustworthiness of the data analysis, the researchers coded and checked the analysis together.

◼ Findings

This section contains the detail of the inductive qualitative analysis of the identified sources in the corpus relating to virtual excursions. The first part of this section involves an overview of the metainformation and profile of

the documents, the second part relates to thematic content in terms of virtual excursions and the third part covers elements of SDL found in the corpus.

◼ Metainformation and corpus profile

From the initial data searches, it was evident that the concept of virtual excursions has been researched quite well; however, the link with SDL is not so evident, and the simultaneous use of both concepts in publications usually meant that either one of the elements was mentioned in a cursory manner. This finding also emphasises the need for increased research on these two concepts together.

This corpus of publications used for this research contained 22 documents covering 89 221 word-tokens in total. Of these 22 documents, 14 were journal articles, 7 were conference papers, and 1 was a book chapter. The spread of publications in terms of year of publication are illustrated in Figure 6.2.

From Figure 6.2, it is evident that from 2020, there has been a significant increase in interest in virtual excursions. The country of study or otherwise (by default) the country where researchers were based also showed interesting trends, shown in Figure 6.3.

The majority of sources in this research come from Russia, Spain and Ukraine. Interestingly, no publications were found from the Global South or even South Africa specifically. Clearly, there is more research necessary in these contexts.

The corpus represented a number of different fields and disciplines. A relatively good representation of education-related publications was found;
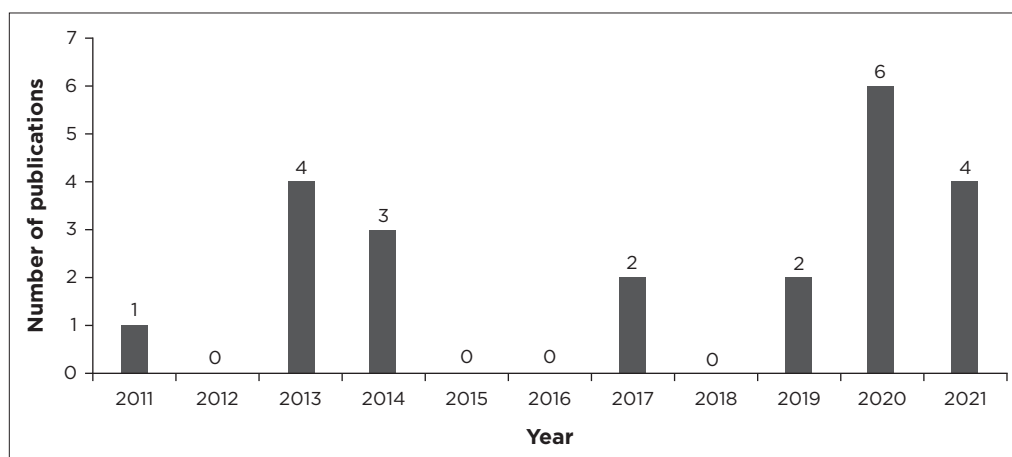
FIGURE 6.2: Virtual excursion publications by year of publication.
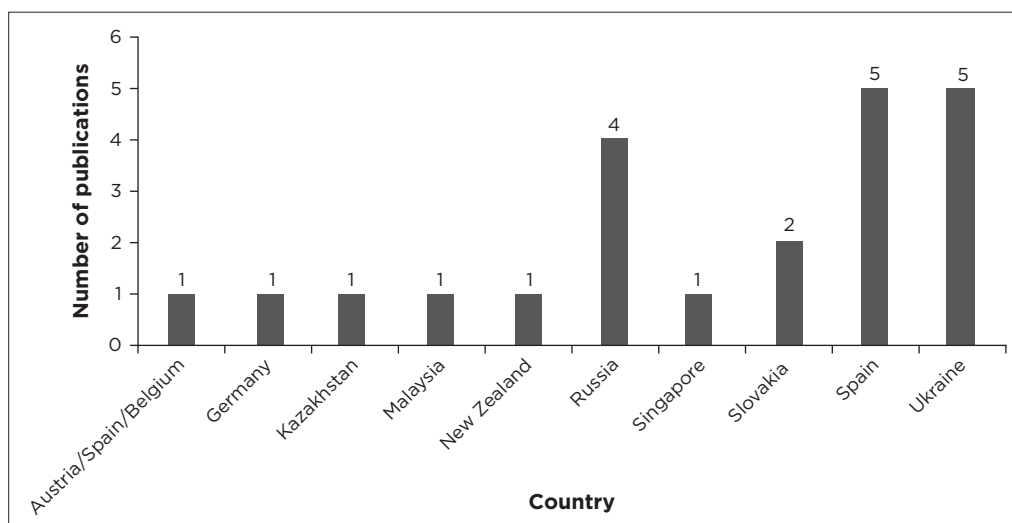
FIGURE 6.3: Virtual excursion publication by country of research or authors' origin.

however, not all were related to formal educational contexts. The disciplinary focus of the sources is summarised in Table 6.1.

The focus of the publications in the corpus varied, as some would focus on the participants' experience (Ananchenkova & Bazhenova 2017; Bell & Smith 2020; Majherová et al. 2014; Tserklevych & Koval 2020) whilst others would relate more to the tools and platforms (Barra et al. 2014; Gallego et al. 2012; Gordillo et al. 2013a, 2013b, 2013c) or also the additional technologies (Fung et al. 2019) being used.

◼ The nature of virtual excursions in the corpus

From the corpus of publications, some broad trends in terms of the nature of virtual excursions could be identified. This specifically related to the purpose of virtual excursions; temporal, spatial, and locational elements; virtual excursions as information resources; virtual excursions as multimodal activity spaces; virtual excursions as praxis spaces; and technical requirements for virtual excursions.

☐ The purpose of virtual excursions

The purpose of virtual excursions differs between contexts, and it may have either informational or educational aims. In this context, Majherová et al. (2014:305) recognised the importance of virtual excursions, but they stated that '[e]xcursions cannot replace theoretical teaching, but their motivational and activating role is important'. A virtual excursion may even support creating

TABLE 6.1: Summary of the disciplinary focus in the corpus.

Discipline	Number of sources	Sources
Chemistry education	1	Fung et al. (2019)
Kindergarten/pre-school	1	Osman & Wahab (2011)
Language education	2	Molchanova et al. (2021) Strelkova & Ryauzova (2020) Tarasenko et al. (2020)
Mathematics	1	Zinonos, Vihrova & Pikilnyak (2019)
Museum education	2	Bell & Smith (2020) Tserklevych et al. (2021) Tserklevych & Koval (2020)
Natural science and language education	1	Pribilová, Gazdíková & Horváth (2014)
Science education	5	Barra et al. (2014) Gallego et al. (2012) Gordillo et al. (2013a) Gordillo et al. (2013b) Gordillo et al. (2013c)
Teacher training	2	Denysenko et al. (2020) Thönnessen & Budke (2021)
Tourism	3	Ananchenkova & Bazhenova (2017) Kabdygalymova & Isabayeva (2017) Kazmina et al. (2020)
Various disciplines	1	Majherová, Palásthy & Gazdíková (2014)

a context relevant to a specific profession (Ananchenkova & Bazhenova 2017; Pribilová et al. 2014; Thönnessen & Budke 2021) such as is the case for this volume in which the focus is on teacher training. In this regard, Ananchenkova and Bazhenova (2017:133) also noted within the context of tourism how an 'occupation excursion' could have an instructional value.

Excursions may also have a clear pedagogical purpose as they aim to educate and create a space for learning. This may involve a focused virtual excursion with a specific purpose or even a more extensive excursion approach such as the GLOBAL excursion project (Barra et al. 2014; Gallego et al. 2012; Gordillo et al. 2013a, 2013b, 2013c; Kieslinger et al. 2013) or at a secondary school (Majherová et al. 2014; Pribilová et al. 2014) or even kindergarten (Osman & Wahab 2011) level. However, in some cases, the excursion might aim to educate in a context outside of the formal education sector as is the case of museums for example (Bell & Smith 2020; Tserklevych & Koval 2020; Tserklevych et al. 2021).

☐ Temporal, spatial, and locational elements of virtual excursions

An important advantage of virtual excursions is that participants have the opportunity to cross temporal, spatial, and locational boundaries in order to 'visit' places and times without physically being there (Ananchenkova & Bazhenova 2017; Kabdygalymova & Isabayeva 2017; Kieslinger et al. 2013;

Molchanova et al. 2021). Virtual excursions can also be done either online or offline which, in turn, have different technical requirements (Majherová et al. 2014).

Virtual excursions can be conducted either synchronously or asynchronously, which provides both live and flexible access. Kieslinger et al. (2013) noted how the use of videoconferencing software may support a synchronous virtual excursion. In terms of progression through a virtual excursion, it is important to note that with virtual excursions, students can move at their own speed and pace (Thönnessen & Budke 2021). However, importantly, Thönnessen and Budke (2021:262) observed that such 'greater individual flexibility for participants does not necessarily isolate individuals, which is an encouraging result for both teacher educators and preservice teachers'.

The use of both in-person and virtual modalities for excursions is called a hybrid excursion (Thönnessen & Budke 2021). Majherová et al. (2014) also noted that virtual excursions can have a hybrid format, having either a virtual pre-phase with an in-person excursion or in-person preparation with a virtual implementation of the excursion.

The spatial realms created for virtual excursions may be fictional but may also represent real-world settings (Ananchenkova & Bazhenova 2017; Molchanova et al. 2021). In terms of real-world settings, these may be cities, museums, parks (Molchanova et al. 2021; Tserklevych & Koval 2020; Tserklevych et al. 2021), and even places of pilgrimage (Ananchenkova & Bazhenova 2017). Often virtual excursions are framed and made interactive by means of clickable maps (Tarasenko et al. 2020).

Virtual excursions tend to occur on a continuum in terms of how structured and participant-driven they can be. On the one end, participants determine where and how they experience the excursion (Ananchenkova & Bazhenova 2017), and in other cases, the excursion can be carefully planned with set stages with some interactivity (Barra et al. 2014; Tarasenko et al. 2020) or at the other extreme, a very set course. In this context, Thönnessen and Budke (2021) agreed with this view when they made the following statement:

> Field trip types involve varying level of self-organisation required during the learning process; they span from the highly passive overview excursion, which conforms to the traditional notion of a field trip, to the constructive concept of self-led excursions. (p. 257)

◻ Virtual excursions as information resources

An integral part of excursions is the fact that they contain information resources. These resources vary in terms of medium and modality and can include any of the following and combinations thereof: text, images, sound clips, video clips, animations, interactive applications, live sound or video feed,

assessments, polls, online games, virtual reality content, and even embedded courses.

In this context, Barra et al. (2014) noted the relevance of open educational resources for use within virtual excursions and in this case, specifically for science teaching. Within the wider context of this chapter, the relevance of open education for SDL is evident from the literature (Olivier 2020b, 2021). Similarly, the inclusion of participant-generated content is also relevant here, and it would be sensible for this to be openly licensed. A further example of this type of approach links up with the concept of renewable assessments (Olivier 2021) where student-created content is reused, and this was noted by Bell and Smith (2020) where childrens' contributions were included as resources for reuse by teachers.

An interesting finding by Majherová et al. (2014) is that the level of knowledge differed between students attending virtual, in-person or combined excursions: the highest level was found where students attended both virtual and in-person excursions, followed by lower levels for in-person and the lowest for virtual excursions. Conversely, Molchanova et al. (2021) found in terms of language competence that there is no difference between virtual and in-person excursions. Osman and Wahab (2011) also could not confirm whether the learning process was more effective through the virtual excursion than it would be otherwise.

☐ Virtual excursions as multimodal activity spaces

Virtual excursions have the potential to create contexts where participants can interact and engage in what could be termed multimodal activity spaces. The multimodal nature of virtual excursions extends beyond the different technological and medium-related modalities but also lingual aspects (Tarasenko et al. 2020; Tserklevych et al. 2021). This view was supported in the corpus when Molchanova et al. (2021) made the following observation:

> The excursion, both full-time and virtual, is a visual process of a person's cognition of the world around him, built on pre-selected objects and contributes to the formation of basic competencies: linguistic and cultural, linguistic, communicative. (p. 37)

Within this context, Ananchenkova and Bazhenova (2017:133) noted how virtual excursions can increase the 'productivity of educational activities', whilst Denysenko et al. (2020) and Tarasenko et al. (2020) emphasised the learning potential of augmented reality in virtual excursions in terms of real-life immersive experiences. In terms of multimodality, Majherová et al. (2014:307) stated that 'there are several elements that bring about the best experience for a virtual tour' and that '[s]ound effects, voice translations, music and the content play different roles that make the entire project a success'.

A further common multimodal element of virtual excursions is the inclusion of video conferencing elements (Ananchenkova & Bazhenova 2017). The use of online virtual tours is also regarded as a possible element of a virtual excursion (Majherová et al. 2014). Additionally, with a virtual reality approach, photospheres can be utilised to create life-like and very real virtual experiences (Fung et al. 2019). This process was explained by Fung et al. (2019):

> Photospheres form the backbone of the VR field trip. Students are immersed in environments governed by the sequence of photospheres. A series of photospheres can be connected via 'teleporter', an element in the app that allow the student to move from point A to point B. This element allows the students to explore an environment at their own pace if they wish. (p. 384)

Even here, the student freedom in terms of movement and pace is emphasised within this highly immersive context. However, complex virtual environments and platforms may require better and faster Internet connections and stable connectivity (Majherová et al. 2014) and may have implications for access to the excursion for all students.

Furthermore, throughout the corpus, the use of different modes of communication – apart from only text-based content – was noted (Ananchenkova & Bazhenova 2017; Fung et al. 2019; Kazmina et al. 2020; Kieslinger et al. 2013; Osman & Wahab 2011; Strelkova & Ryauzova 2020). Significantly, Majherová et al. (2014:307) observed that with virtual tours, students 'have the aid of a system that will take them to the actual location and teach them things they could not fathom through mere reading'.

☐ Virtual excursions as praxis spaces

In the case where a virtual excursion provides some form of simulation of a real-world activity, the potential exists for the engagement or at least virtual engagement of disciplinary praxis. In these praxis spaces, participants may take part in activities related to a certain skill or even a specific occupation. Furthermore, Ananchenkova and Bazhenova (2017:133) observed how practical skills could be employed during excursions. Kazmina et al. (2020) also noted the potential of virtual excursions to cover many practical skills to be used one day by students in the workplace, in their case in tourism.

Importantly, a virtual excursion moves from theory to praxis as it involves not merely static knowledge but also practices (Molchanova et al. 2021; Pribilová et al. 2014). In this regard, Molchanova et al. (2021) concluded:

> The task of the educational excursion, both virtual and full-time, is to enrich students with the knowledge, develop their creative abilities, expand their horizons, and establish links between theory and practice. (p. 37)

Apart from the implications virtual excursions would have for participants, there are also certain technical requirements that need to be considered.

☐ Technical requirements for virtual excursions

It is clear that virtual excursions may vary in terms of technical complexity. Furthermore, more immersive and graphically complex experiences would require better connectivity and the availability of larger screens or even virtual reality glasses. In this context, there was a specific focus in some publications on virtual reality (Fung et al. 2019) and augmented reality (Denysenko et al. 2020; Zinonos et al. 2019). However, it is interesting that from the corpus the need for simpler or so-called *low-tech* solutions was noted (Bell & Smith 2020).

The use of mobile devices has significant potential in opening up access to virtual excursions. From the literature, there are also many references to the use of mobile devices in this regard (Kieslinger et al. 2013). In the mobile context, the use of digital guides on smartphones was also noted (Thönnessen & Budke 2021). Allowing students to use different devices may also lead to problems in terms of the way a virtual excursion is constructed. Within this context, Tarasenko et al. (2020) observed that:

> Since each student used his own smartphone with different technical characteristics and his own software set, sometimes this led to problems with receiving and reproducing information in accordance with the used technology. (p. 140)

■ Elements of self-directed learning in the corpus

The inclusion of elements of and in support of SDL varied between the different publications. In some cases, sources did not refer to the learning or even excursion participation process or even showed evidence of a more teacher or presenter-focused approach (Barra et al. 2014). In some cases, the publications did not refer to the student experience at all (Gallego et al. 2012; Gordillo et al. 2013a, 2013b, 2013c; Pribilová et al. 2014). In this section, a number of general trends were identifiable in terms of SDL. It was found that participant and (by implication) student agency was prominent. It was also evident that there were opportunities for creating an environment that was conducive to SDL, as well as for collaboration for SDL. Furthermore, it was also noted that the following elements were present: the relevance and importance of real-life authentic tasks and experiences; problem-solving and PBL; assessment for SDL; a social context for SDL; and the role of feedback and conclusion of virtual excursions.

☐ Participant and student agency

Central to the virtual excursion is the participant or student in the case of educational virtual excursions. The emphasis in many of the publications is the fact that students independently explore virtual spaces whether they are fairly simple or involve virtual reality (Fung et al. 2019; Kabdygalymova

& Isabayeva 2017; Osman & Wahab 2011; Thönnessen & Budke 2021; Tserklevych & Koval 2020). In this regard, Molchanova et al. (2021:39) acknowledged that 'virtual excursions acquire special value as a product of the activities of the students themselves'. Even at kindergarten level, Osman and Wahab (2011) emphasised the need for children to have freedom to control the learning process in virtual excursions. However, it might be essential to move beyond mere 'operational freedom' (Strelkova & Ryauzova 2020) in order to support true student agency and ultimately SDL.

Furthermore, apart from making it possible for participants to access a great deal of information, they can also engage with the content and activities that may prompt further cognitive processes (Kabdygalymova & Isabayeva 2017). Through active participation and source selection, it may be possible for students to co-create the excursion itself (Tarasenko et al. 2020). Similarly, potential elements of SDL were evident from the explanation given by Molchanova et al. (2021) why their foreign language-learning intervention was done by means of a virtual excursion:

> The relevance of the use of excursions in the learning process is dictated, first of all, by the pedagogical needs to increase the effectiveness of learning and, in particular, by the need to develop individual learning skills, research and creative approach to learning, critical thinking, and the study of a new culture. (p. 36)

Despite the focus on tourism and specifically pilgrim tourism, the excursion described by Ananchenkova and Bazhenova (2017) specifically highlights the possibility for students to set up their own algorithms and set their own routes in exploring specific sites. It is, noted how, with the aid of the teacher students, it is possible to create conditions that allow students to do an 'independent search' (Ananchenkova & Bazhenova 2017:132), whilst the activities of the teacher give way to that of the students. Kabdygalymova and Isabayeva (2017) also approached virtual excursions in terms of tourism, and they make the following observation:

> During the tour, the audience not only sees the objects, on the basis of which the theme is revealed, and hear about these objects' necessary information, but also acquire practical skills of self-observation and analysis. (p. 4)

In a language-learning context, Tarasenko et al. (2020) also noted the importance of a more self-directed approach which was conveyed thus:

> The use of augmented reality (AR) technology requires appropriate methodological didactic reorientation, which will create the opportunity for students to independently organize research, collect, evaluate, process and present information, apply complex hypertext structures, develop network thinking, work within flexible, group, project-oriented forms of training. (p. 139)

Similarly, Thönnessen and Budke (2021) noted how students – in this case, student-teachers, as is the case in the rest of this book (cf. ch. 1) – could devise digital field trips by themselves. In this case, this involved students setting up the excursions and then having peers test them out.

Such student or participant activities in excursions are often facilitated by a guide or teacher. In this regard, Molchanova et al. (2021:38) note the role of the teacher to 'guide' and not lead the excursion and to also 'stimulates the exchange of opinions'.

□ Creating an environment conducive to self-directed learning

The issue of a learning environment is essential for fostering SDL (Du Toit-Brits 2021). From the corpus, the way in which the virtual excursion environment could be in support was also discerned. According to Kazmina et al. (2020:6), virtual excursions specifically are of value to participants 'who want to realise themselves as fully as possible in the specialised field'. Moreover, Thönnessen and Budke (2021:257) noted, although not calling it SDL, that virtual excursions promote 'independent learning' and that 'learning to work independently is a core skill for students to develop'.

From the corpus, the importance of motivation to learn was evident (Ananchenkova & Bazhenova 2017; Denysenko et al. 2020; Kabdygalymova & Isabayeva 2017; Majherová et al. 2014; Molchanova et al. 2021; Osman & Wahab 2011; Tarasenko et al. 2020). In some publications, the positive feedback from students was also noted (Fung et al. 2019). Interestingly, Osman and Wahab (2011) explained how adapting the approach to interacting with the technology increased motivation and positivity towards the virtual excursion within the context of kindergartens in Malaysia.

Elements of active learning and interactivity were also highlighted (Ananchenkova & Bazhenova 2017; Kabdygalymova & Isabayeva 2017; Tarasenko et al. 2020) in the corpus. According to Kabdygalymova and Isabayeva (2017:3), this implies being able to 'move from the explanatory and illustrated method for activity training, in which the child becomes an active subject of learning activities'. However, Thönnessen and Budke (2021:261) warned that virtual excursions can easily lead to being 'static learning settings' and that when students are creating the virtual excursions themselves, they might find it difficult to create a space allowing for a 'high level of self-organisation'.

□ Collaboration

Collaboration for learning is highly relevant for SDL, and this was also found in the reporting on the excursions in the corpus. In this regard, sources highlighted the importance of creating opportunities for students to collaborate during excursions (Ananchenkova & Bazhenova 2017; Bell & Smith 2020; Kieslinger et al. 2013). In this context, Lee et al. (2014) noted the importance of collaborative learning together with SDL within the context of the needs of the 21st century.

The way in which virtual excursions are set up may support both collaborative as well as individual activities as it is 'possible to develop skills of collective activity, whilst simultaneously fulfilling the individual potential of each learner' (Kazmina et al. 2020:4) in such contexts. In language-learning contexts, communication through collaboration takes on a further role as it can support language learning. In this regard, Tarasenko et al. (2020) made the following observation:

> The communication of the group members during the preparation of the virtual tour also contributed to the formation of teamwork skills among students and provided them with the opportunity to develop communication skills in foreign languages. (p. 136)

In this publication (Tarasenko et al. 2020), there was also evidence of the collaboration contributing to the acquisition of certain language structures from students interacting with each other. Apart from the opportunities for working together, the nature of the task also seems important, and to this end, the need for real-life authentic tasks and experiences were evident.

☐ Real-life authentic tasks and experiences

The importance of real-life and authentic content (Merriam & Bierema 2014) was noted earlier in this chapter and virtual excursions show particular promise in this regard (Denysenko et al. 2020; Kazmina et al. 2020; Kieslinger et al. 2013; Osman & Wahab 2011). The use of AR in virtual excursions may prompt real-life immersive experiences (Denysenko et al. 2020). A significant statement was made by Kazmina et al. (2020) in this regard in terms of virtual excursions and its technologies:

> Application of such technologies may become a kind of bridge between theoretical education and obtaining practical skills, promote utilising of individual approach to teaching, applying new educational forms and methods, which make it possible to train students with consideration for present-day imperatives and conditions for tourism development. (p. 1)

Apart from this source specifically focusing on training students for the tourism industry, overall virtual excursions have the potential to provide real-life simulations for other fields as well. Kieslinger et al. (2013:3) also observed that '[b]y connecting e-Infrastructures, resources and tools with schools, pupils can experience challenging and authentic learning scenarios'. However, Majherová et al. (2014) were of the opinion that virtual excursions lack authenticity.

☐ Problem-solving and problem-based learning

In terms of simulations, the importance of problem-solving was noted as Kazmina et al. (2020:6) remarked that in this context, the 'presence of problematicity and variability of potential solutions is essential'. This aspect

ties in with the extensive literature showing how problem-solving (Havenga et al. 2013) and PBL (Havenga 2016; Ozuah, Curtis & Stein 2001) can be supportive towards SDL.

From the corpus, the opportunities for PBL in virtual excursions were also noted (Kieslinger et al. 2013; Thönnessen & Budke 2021). Similarly, Osman and Wahab (2011:1) noted how a virtual excursion may provide opportunities for learning 'through exploration, trial and error, collaboration, experimentation, role-playing, and pretending whilst they are playing'. Thönnessen and Budke (2021:257) noted that 'adopting a problem-based approach to field trip planning is key, where the key question of a field trip determines the learning outcomes and methods'. However, they also found that it would be difficult to follow such an approach in student-generated virtual excursions, as according to Thönnessen and Budke (2021), the following was observed in their study:

> Where student-teachers were encouraged to develop their own problem-based questions during the field trip and select and implement their own methods to tackle a problem, [*it*] was considered too challenging by student-teachers. (p. 261)

Hence, using a problem-based strategy within the virtual excursion was found to be challenging for this specific cohort; however, overall this seems to be a sensible approach. In this regard, assessment opportunities (in terms of the problem-based approach but also more generically) seemed to be prominent within the corpus.

☐ Assessment for self-directed learning

Very few of the publications in the corpus specifically noted anything about assessment. However, in the publication by Ananchenkova and Bazhenova (2017), aspects of 'mutual assessment' and the relevance of feedback were noted. For Kazmina et al. (2020:6), assessment within virtual excursions involved that 'upon completion of the education process, students could fully fulfil themselves in practical activities'.

Assessment, within the use of excursions, can also happen through peers and groups. Thönnessen and Budke (2021) described a student-driven excursion where peer testing and then group-based assessment were done. This approach aligns with the assessment noted in Chapter 10 which recounts how e-posters were used as a form of self-directed multimodal assessment.

The potential of the use of mobile devices for the purposes of excursions may allow students to be able to generate content and then upload it for use within the excursion space (Kieslinger et al. 2013). Such functionalities also have clear further assessment potential. Molchanova et al. (2021:39) listed a number of possible assessment tools as pre-activity to a virtual excursion; these included 'report, talk, album creation, or short presentation'. Whilst Thönnessen

and Budke (2021) also noted the advantages of pre-discovering activities and ultimately also post-discovering activities for excursions.

☐ Social context for self-directed learning

From the literature on SDL, the context and specifically also the social context is quite important (Brockett & Hiemstra 2019; Garrison 1997; Knowles 1975). Specifically, Brockett and Hiemstra's (2019) concept of social context is relevant in this regard. Within the corpus, this element was also noted especially in terms of the individual's role in and conception of the virtual context. In this context, Thönnessen and Budke (2021) noted how the concept of *place* can be regarded as both an individual and social construct when it comes to field trips – once again enforcing the concept of learning individually or collaboratively (Knowles 1975). Furthermore, linking up with the concepts self-directed multimodal learning (ed. Olivier 2020a), Thönnessen and Budke (2021) observed:

> The perception of place also involves considering and investigating these places as elements of communication and action if the traditional field trip is to be conceptionally and methodically developed further. (p. 257)

Hence, even if the context is virtual, the sense of place and space would have an effect on the knowledge-making process.

☐ Feedback and conclusion of virtual excursions

Assessment within the virtual excursion sphere often relates more to feedback on the excursion itself rather than overtly assessing certain skills or knowledge. Majherová et al. (2014) acknowledged evaluation and elements of feedback as part of the structure of a virtual excursion. In addition, Molchanova et al. (2021:38) also noted the teacher's role to conduct 'a survey of students to assess the effectiveness of the event'. Other publications also noted the importance of obtaining such feedback (Tarasenko et al. 2020).

Some reflection or concluding activity seems to be very important. This aspect may be of support to metacognition, especially when as an 'ability to reflect on our own mental representations to regulate cognition and optimise learning' (Goupil & Kouider 2019:403). In the corpus, this aspect was also pertinent and Molchanova et al. (2021) detailed the nature of a summarised or concluding activity:

> Each excursion, regardless of the format of its conduct, should end with a summing up – this is the goal of the final stage. Final conversations are of great educational and educational value. In the course of the conversation, students expand, deepen and consolidate their knowledge of the material studied during the excursion. They briefly report on the results of their self-performed work. The teacher asks students questions, corrects the answers. The material collected during the excursion is processed by the students and then used for further study. (p. 38)

This view specifically highlights the need to conclude the excursion and make this a communicative and collaborative action. Importantly, this phase is described as a conversation and consolidation. Consequently, this is regarded – specifically in this source – as the pinnacle of the virtual excursion. The teacher is also involved but in a side-lined questioning and semi-remedial position, whilst finally, the processing for further use is also centred around the students. In the publication by Pribilová et al. (2014), the consolidation of knowledge was evidenced through action-simulating elements.

■ Discussion

Some general trends and clear gaps in the literature were evident from the findings. In this corpus, the trend towards increased interest in virtual excursions is evident. This may also be linked to developments in technology but also considerations around the COVID-19 pandemic, during which time in-person excursions were not possible. There is a good spread of countries represented here, with Russia, Spain, and Ukraine being quite prominent; however, the lack of publications from the Global South is significant.

In terms of disciplinary focus, many of the fields covered are geared towards specific professions. However, thematically, science education is the most prominent, followed by tourism and then language education, museum education, and finally teacher training.

Certain constraints of virtual excursions were also evident from this literature review. Firstly, virtual excursions require access to specific platforms and technologies in order for users to be able to fully participate in such excursions. Furthermore, unique skills are required both of teachers and or administrators of virtual excursions as well as students enrolled in such excursions. In some cases, such technological, social and language skills will have to be developed before the excursion or even supported throughout. A lack of opportunity for student content contribution to virtual excursions has been identified as one possible constraint in some contexts. Some virtual excursions provide limited freedom in terms of movement or student agency, which also may have negative implications towards supporting SDL. Platforms and devices may also place certain constraints on the flexibility and scope of virtual excursions.

In terms of the thematic analysis of the corpus of documents, certain common concepts emerged. Firstly, virtual excursions vary in terms of focus and purpose, as they can merely be informative but also pedagogical, especially in informing about a specific context or profession. A key characteristic of virtual excursions is the fact that they are more flexible in terms of access with regard to temporality, spatiality, and real-life or fictional locations. The structured nature of excursions varies from highly structured

and even guide-focused or teacher-focused to more user-centred or student-centred with a great deal of freedom. Excursions act as ways of sharing information, and this can even be done through open licences.

The virtual excursions also act as means towards multimodal meaning-making as different modes of communication and by implication, technologies can be utilised in the excursions. Technologies such as video conferencing add many opportunities for synchronous collaboration. Excursions can also act as praxis spaces where certain skills can be practiced and acted out in a safe and supportive environment. Such activities also contribute to active participation versus passive observation. Finally, the nature of virtual excursions depends also on the level of technical complexity, as there are many opportunities possible in terms of virtual and even AR. Such approaches can also increase the level of immersion. From the corpus, the issue of mobile devices also seems to be an important trend.

The corpus also showed a number of elements that can be associated with SDL. Firstly, from the corpus, participant and student agency seems to be prominent as the user or student tends to be the central focus of the virtual excursion. This is especially true in instances where progress and activities rely on the user or student's actions with optional guidance by a guide or teacher. Within the virtual excursion context, it is possible to create an environment that can be conducive of SDL in terms of setting certain tasks, motivating participants, and prompting interactivity. Furthermore, these spaces also lend them to various forms of collaboration in terms of experiencing, taking part in, or even creating virtual excursions. A key aspect which is relevant to both SDL and most virtual excursions is real-life authentic tasks, experiences, and content. Many activities in virtual excursions are also related to problem-solving and PBL. Assessment opportunities may also be in support of SDL, especially when it is done collaboratively. Social aspects were also noted, as a virtual excursion can create a highly relevant social context. Finally, excursions are often finished off with feedback and reflections, prompting specific metacognitive potential in terms of SDL.

■ Recommendations

From the synthesis of the publications in this systematic review, a number of recommendations could be made in terms of the implementation of virtual excursions especially in terms of SDL. Firstly, it is essential that students are prepared for taking part in virtual excursions (Pribilová et al. 2014).

From the corpus of publications, the opportunities for participants to take charge of the progression within a virtual excursion are evident, but it is recommended that such activities could also be driven by means of what Fischer (2013:38) terms the 'context of realistic, open-ended, ill-defined problems'.

Importantly, the time in virtual reality spaces as part of virtual excursions should be carefully planned with sufficient breaks in between sessions (cf. Fung et al. 2019).

Content, assessments, and specifically simulations (Kazmina et al. 2020) should correspond with authentic and real-life contexts and activities. Furthermore, an important aspect in setting up excursions is the fact that they should be shareable or, in the words of Kieslinger et al. (2013), it should be possible to clone excursions in order for content to be translated and localised. This aspect prompts the need for excursion content to be shared as open educational resources (Olivier 2021).

Where it is possible, the use of hybrid in-person and virtual excursions should be considered in order to support authentic knowledge making (Majherová et al. 2014; Thönnessen & Budke 2021). If challenges are encountered in terms of continuous and expensive Internet access, then offline virtual excursions could be considered (Majherová et al. 2014). The role of teachers or guides within virtual excursions is very important, and they should not be at the centre of the excursion but rather act as guides (Molchanova et al. 2021), providing questions and steering students toward outcome-related aims.

In the case where students generate the virtual excursion, additional support might be necessary. This aspect is described by Thönnessen and Budke (2021:262): 'Teacher educators need to provide student teachers with the pedagogical knowledge, tools and enough time to develop reusable high-quality field trips with the help of digital media'.

When students are central to the creation of the virtual excursion, some support might be necessary for creating an environment that is conducive to SDL as students may find constructing an excursion that is very self-organised to be difficult to do (Thönnessen & Budke 2021).

It is finally recommended that conclusion activities are well planned as they serve a very important pedagogical function (Molchanova et al. 2021). To this end, this is a communication-rich activity in which students are central and through which the affordances of the virtual excursion are collaboratively reflected upon and synthesised for learning purposes.

In conclusion, it is clear that there seems to be more research necessary at different levels of education, disciplines, as well as geographical and social contexts.

■ Limitations

Some limitations were identified through the research process. In this regard, the corpus is limited to the publications obtained from the selected databases and only publications written in English. Furthermore, not all research in which

virtual excursions were implemented called the interventions as such, and such publications could potentially have been left out. Consequently, it cannot be claimed that all possible publications on virtual excursions were covered; however, efforts were made to cover as many publications as possible.

■ Conclusion

In conclusion, this systematic literature review has shown many diverse trends in terms of the use and purpose of virtual excursions. Some clear gaps were evident as most of the research are limited to certain fields and mainly the Global North. Virtual excursions are unique in that they cover many technological levels of complexity with specific future promises in terms of VR and AR.

Furthermore, this systematic literature review has shown that virtual excursions hold a great deal of promise in terms of supporting SDL. In this regard, user or student agency is a general theme as the participants are the focus of such excursions. However, the nature of control and structure would have an impact on such agency and ultimately the level of interactivity. The importance of collaboration and problem-based approaches are also significant in these virtual social contexts.

However, it is clear that more research is necessary to complement the existing discourses around virtual excursions in order to inform future excursion practices, especially in terms of the fostering of SDL.

Chapter 7

Problem-based learning in a virtual space: Affordances of active online learning

Marietjie Havenga
Research Unit Self-Directed Learning,
Faculty of Education, North-West University,
Potchefstroom, South Africa

Adri du Toit
Research Unit Self-Directed Learning,
Faculty of Education, North-West University,
Potchefstroom, South Africa

■ Abstract

Problem-based learning is a well-known approach used worldwide as an active and constructive student-centred pedagogy that differs radically from traditional teaching methods. Increasing reliance on online teaching and learning in recent years necessitated reconsideration of the design and structuring of PBL to ensure its continued effectiveness in virtual spaces. This redesign explicitly endeavoured to utilise engaging pedagogies and to support students' active learning in virtual environments. Therefore, the purpose of this conceptual chapter is to consider the adaptation of PBL principles for online learning activities in virtual spaces, with a particular focus on fostering

students' engagement. The research is principally informed by literature study and descriptions – based on personal observations and experiences during the virtual excursion – of how PBL was adapted and implemented in a virtual environment in the first cycle of a DBR approach. In addition, qualitative data and feedback from students who participated in the first cycle of the adapted PBL provide deeper insights into their experiences in the virtual learning environment. Based on the findings, recommendations were formulated for adaptation to PBL to foster meaningful learning in virtual environments, most of which will be implemented in the second cycle of the longitudinal design-based study.

Let's stop asking kids what they want to be when they grow up. Let's ask them what problem they want to solve and then talk to them about what they need to learn to solve the problem! (Casap 2018).

■ Introduction

Problem-based learning has long been recognised as a student-centred, active, and engaging teaching-learning strategy (Bate et al. 2014). Research is accruing reporting the benefits for students when PBL is used as an educational strategy, including studies on students' cognitive development, essential skills development, and professional development, as well as how PBL contributes to preparing students for SDL and functioning in the 21st century (Alt & Raichel 2020; Bagheri et al. 2013; Bate et al. 2014; Havenga 2015; Lurina & Gorlova 2018). The numerous benefits associated with PBL necessitate that this strategy is continued and expanded to extend the benefits thereof using different delivery modes.

In recent years, education is progressively being offered using online learning, together with various technologies to facilitate or enhance its implementation. The social distancing necessitated by the worldwide COVID-19 pandemic in the years 2020 and 2021 resulted in the accelerated adoption and implementation of online learning (Cowin 2020). Considering the numerous benefits of PBL, ways to effectively utilise it as a teaching-learning strategy in online education had to be investigated. Problem-based learning also brought attention to the notion of SDL as an avenue for developing responsibility for own learning, which is gaining prominence in fostering learning in online environments (Zhu 2021). It is, however, not clear how PBL can be implemented in online settings to promote active and responsible learning. There is thus a renewed interest in how teaching and learning must be contextualised in an interconnected and virtual space associated with active online learning.

Therefore, this chapter aims to provide conceptual insights into how PBL can be structured for a virtual space to promote students' active learning. As a starting point, the origins of PBL are discussed. The benefits associated with using PBL as a teaching-learning strategy are then enumerated, followed by

explanations of how it is designed and structured for optimal learning value. The rationale for adapting PBL for online learning (PBOL) in virtual spaces is then explained with the research problem and question that guided this investigation. Subsequently, details of how PBL was adapted for online learning in the first cycle of a DBR approach are explained and discussed. Feedback from students who participated in this first cycle of adapted PBOL is used to elucidate their experiences in this regard. Recommendations for future research are made for implementation in subsequent DBR cycles to continue improving its value and meaningfulness for students. The chapter concludes with final statements of the benefits and areas for improvement in PBOL that emerged in the current investigation.

■ Problem-based learning

As an active and constructive, engaging, and student-centred pedagogy, PBL differs radically from traditional teaching methods where students are passive recipients of information (Bessa, Santos & Duarte, 2019). Although no formal definition of PBL is given, it is a teaching-learning approach that involves interactive student-centred learning to address an ill-structured problem in small groups (De Graaff & Kolmos 2003). Problem-based learning is an example of inductive teaching and learning. Inductive teaching and learning clarify the need for learning through understanding and application, rather than starting with direct instruction of 'facts' and then moving to their application potential (Ertmer & Glazewski 2015). In this manner, students 'encounter theoretical concepts in situations that are rich in content and meaning' (Alt & Raichel 2020:3), which contributes positively to knowledge retention, higher levels of cognitive thinking, deep learning, and the development of several key competencies and transferable skills (Ertmer & Glazewski 2015).

Problem-based learning engages students in identifying, analysing, and solving *bona fide* problems as a point of departure, and it subsequently requires productive discourse, reflections, and the co-construction of knowledge and understanding (Ertmer & Glazewski 2015; Gomoll, Hillenburg & Hmelo-Silver 2020). The rationale for using PBL as participatory pedagogy is to solve a problem, provide responsible learning, and integrate learning content with valuable practical experiences in real-world contexts (Savery 2015). The premise of employing PBL is that students will better understand and develop knowledge relevant to real-world environments when they are actively involved in the learning process (Alt & Raichel 2020).

■ Philosophical and historical influences

Historical and theoretical influences regarding philosophy, psychology, and medical education led to the emergence of the PBL pedagogy

(Servant 2016). In her thesis 'Revolutions and re-iterations: An intellectual history of problem-based learning', Servant (2016) critically discusses the conundrum regarding the influence of several scholars in the development of PBL, namely Dewey, Rogers, Bruner, Piaget and Vygotsky. Four universities were initially involved in the development of the PBL model. In the Netherlands, the University of Maastricht was primarily influenced by constructivist psychology (Vygotsky, Piaget & Bruner) and Roskilde (Denmark) by the Marxist views (e.g. Freire's view on education and injustices of capitalism). The University of Aalborg (Denmark) and McMaster (Canada) were inspired by humanist psychology and philosophy Involving Rogerian and Deweyan views (Servant 2016).

From a philosophical point of view, PBL relates to social constructivism as knowledge is constructed in formal social settings when addressing a problem together (Bridges et al. 2020). Problem-based learning, underpinned by social constructivism, focuses on students' active engagement in their own learning. Abdullah, Mohd-Isa, and Samsudin (2019) emphasise students' social interaction and knowledge construction with peers to develop solutions to a problem. In congruence with this, Ansarian and Mohammadi (2018) emphasise students' active involvement in critical discourse as they are exposed to solving unstructured problems or dilemmas related to the real world. Moreover, Ansarian and Mohammadi (2018) argue that PBL is centred on educational theories such as high-order thinking (which includes evaluation of a problem and creation of new knowledge) and Vygotsky's ZPD, where learning develops through supportive group work and feedback activities.

Benefits of using problem-based learning as a teaching-learning strategy

Problem-based learning introduces problems from a real-world context, supports inquiry, promotes innovative thinking, and provides participation in learning and construction of new knowledge (Bagheri et al. 2013; Savery 2015). Moreover, PBL is characterised by students' ability to work cooperatively, think critically, and solve the problem at hand (Savery 2015). Problem-based learning is organised according to small groups where members interact for the 'joint-construction of knowledge' and participate in cognitively challenging tasks (Shroff et al. 2021:203). Key competencies involved in such a student-centred approach are responsibility, autonomy and accountability, respect for each other, student and facilitator interdependence, reflexivity, and active participation (Lea et al. 2003, as cited by Coleman and Money 2020). Employing PBL as a teaching-learning strategy also promotes the development of several skills essential for thriving in the 21st century, including SDL abilities (Savery 2015).

☐ Problem-based learning develops skills that students need to thrive in the 21st century

Several key skills are reported as being vital, or even critical, for students to not just survive in the 21st century but to thrive in life and be able to adapt to change in these challenging times (Schoeniger 2021). These 21st-century skills are often closely aligned with the skills required by employers, implying that 21st-century skills are essential – not only as preparation for the world of work – but also for everyday life (Häkkinen et al. 2017; Schoeniger 2021). Pedagogical approaches that will enhance the development of 21st-century skills are needed to ensure they are realised in practice (Cowin 2020). Numerous studies have reported that PBL contributes significantly to developing several 21st-century skills. Depending on the structuring of the PBL, the following 21st-century skills were reported to be associated with or developed through this strategy, namely agility, effective problem-solving, critical thinking, creativity, collaboration, communication, digital literacy, and technological skills (Cowin 2020; Häkkinen et al. 2017; Lurina & Gorlova 2018; Schoeniger 2021).

☐ Problem-based learning: Towards self-directed learning

Several scholars indicated that PBL enables students to foster SDL (Bagheri et al. 2013; Hmelo-Silver 2004). Self-directed learning involves a devoted effort by oneself to actively engage in the learning process (Guglielmino 2013). Such an effort comprises motivation, detailed planning, decision-making, and controlling and organising activities to achieve specific goals (cf. ch. 5 and ch. 6). Self-directed learners think critically, are open-minded, eager to ask questions and seek the truth (Par & Thant 2020). In SDL, there is a shift in accountability where each individual manages his or her own learning processes. A self-directed learner is driven by goals and challenges, explores new developments, makes informed decisions and reflects on learning, persists in solving complex problems, applies appropriate learning strategies, and evaluates the learning outcomes (Guglielmino 1977; Knowles 1975; Sumuer 2018). Additional competencies of self-directed learners involve technical abilities, continuous upskilling, and innovative thinking. Guglielmino (2013:4), known for her scholarly work on SDL, highlights, 'in a world of unprecedented proliferation of information and technology … self-directed learning is now, more than ever, a necessity for survival, at multiple levels'. Developing SDL in PBL does not imply that learning becomes an individualistic endeavour. Cooperative abilities and group skills developed in the PBL process are needed to foster and support interaction between students and their peers or with their lecturers (Mohd-Yusof 2017). However, the benefits of learning associated with the PBL process will be optimised if students experience a sense of belonging and are actively engaged in their learning process.

☐ Engaging students in problem-based learning groups to foster a sense of belonging

One of the beneficial characteristics of PBL is that it requires effective group work, where all members cooperate in addressing a multifaceted problem (Johnson & Johnson 2018). CL (cf. ch. 8) promotes positive interpersonal relationships, positively contributes towards students' self-esteem, and results in greater efficiency in learning (Mozas-Calvache & Barba-Colmenero 2013). Therefore, incorporating student engagement into the PBL process serves not only to support learning but also to benefit individual and interpersonal development.

Mohd-Yusof (2017) compiled a cooperative problem-based learning (CPBL) framework which can be utilised in guiding students in group activities. The framework is based on Johnson and Johnson (2014)'s views on CL and the social interdependence theory, namely that each member must contribute to the group (positive interdependence), an individual is responsible for performing specific tasks (individual accountability), members enhance each other's learning (promotive interaction), they support each other to 'achieve mutual goals' (interpersonal skills), and they reflect together on their achievements (group processing) (Johnson & Johnson 2014:84–91). The CPBL framework underpins (Mohd-Yusof 2017):

• individual knowledge construction to enhance personal accountability
• construction of knowledge and interaction with group members (positive interdependence, promotive interaction, interpersonal skills, and group processing)
• class synergy and interaction with the facilitator.

A critical aspect of cooperative work is the sense of belonging and welfare, as these factors positively influence members' responsibility, performance, and contribution to the group (Johnson & Johnson 2018) (cf. ch. 8). Peterson, Beymer and Putnam (2018) studied synchronous and asynchronous learning and small groups. Students involved in face-to-face cooperation (synchronous) enhanced their high-level thinking and sense of belonging in online learning contexts. In contrast, in asynchronous cooperative settings, it did not result in the intended interdependence amongst group members (Peterson et al. 2018). Moreover, researchers emphasise that the ability to belong is a driving force of group cooperation rather than competition and that social presence in online learning can strengthen students' continued engagement and interaction.

To enable and foster the development and realisation of the numerous benefits associated with PBL, it is vital that the teaching-learning process is designed judiciously.

TABLE 7.1: Principles used for designing problem-based learning for active learning.

Principle	Rationale	Supporting recent literature
1. Drive authentic problem-solving	The facilitator selects an appropriate ill-defined problem or challenge as the driving force of PBL	Alt & Raichel (2020) Bessa et al. (2019) Saputra et al. (2019)
2. Facilitate student-centred learning	Class activities involve student-centred learning. The facilitator guides and scaffolds active learning.	Alt & Raichel (2020) Zhu et al. (2021)
3. Promote learning autonomy and ownership	Students take primary responsibility for their learning, clarify their roles and take ownership of specific tasks	Alt & Raichel (2020) Bessa et al. (2019)
4. Promote cooperation and communication	Students engage and cooperate with members and participate in effective communication	Mohd-Yusof (2017) Johnson & Johnson (2018)
5. Develop higher-order thinking	Members are actively involved in knowledge construction, critical thinking and problem-solving	Saputra et al. (2019) Seibert (2021)
6. Promote metacognitive thinking	The facilitator provides authentic feedback, frequent reflection, and adaptation for improvement	Zhu et al. (2021)
7. Manage the teaching-learning environment	The facilitator sets up requirements and deadlines to scaffold students' management of their activities	Bessa et al. (2019) Saputra et al. (2019)
8. Integrate digital technologies and resources	The facilitator integrates relevant and transformative technologies, platforms, resources, and tools to support students' active problem-solving activities	Bessa et al. (2019) Harron & Mason (2021)
9. Promote knowledge integration and innovation	The facilitator addresses knowledge gaps, provides for knowledge construction and integration, and supports students' innovation and creative outputs	Alt & Raichel (2020) Saputra et al. (2019)
10. Plan for assessment integration and evaluation	The facilitator plans to implement relevant assessment approaches, uses appropriate assessment tools, and determines whether outcomes have been achieved. Students are involved in self- and peer-assessment	Alt & Raichel (2020) Harron & Mason (2021)

Source: Adapted from Havenga (2015).

■ Designing problem-based learning for active engagement

Several design principles or essential features of PBL are reported in the literature. A few general principles regarding PBL as a teaching-learning strategy are: (1) it is driven by a probing question or open-ended problem, (2) it requires facilitation and guidance from the lecturer and the support of a tutor, (3) it involves the collaboration of students, and (4) it provides for the development of several essential skills, including SDL abilities (Thorndahl & Stentoft 2020). A more detailed overview of the principles used for constructing PBL activities, as derived from literature, is included in Table 7.1.

■ Problem statement and research question

'The only certainty in education is change' is a familiar adage to education professionals (Fitzgerald & Gunter 2011). Few events in history severely impacted education as did the worldwide COVID-19 pandemic of 2020

and 2021. Such circumstances necessitated the accelerated adoption and implementation of online learning. However, online learning is not novel and has been steadily expanding for years, even before the onset of the pandemic (Cowin 2020) (cf. ch. 1). Digital tools, applications, and technologies are continuously being developed to support online learning. These also saw a drastic increase because of the pandemic's restrictions on contact teaching (Cowin 2020). Online learning can include virtual face-to-face interactions, such as online lectures, webinars, or virtual meetings, independent of time or geographic location (Jaloliddin 2020). Virtual spaces refer to digitally supported environments that use computer-mediated communication to replace or supplement face-to-face teaching-learning experiences (Golightly 2018). Despite the proliferation of tools and technologies to support online *teaching*, it became evident that online *learning* did not always realise as intended (Cowin 2020). Two of the main reasons for this disparity were that students and lecturers felt isolated and disengaged from the learning process (Cowin 2020; Miller et al. 2021) and that students lacked the skills to self-directedly contribute to and take ownership of their learning (Zhu 2021).

Against the background of the benefits associated with PBL and the increased usage of online learning, we had to explore how PBL could be offered as part of online learning in virtual spaces. Savin-Baden (2007:15) mentions that PBL online 'captures that vast variety of ways in which problem-based learning is being used synchronously and asynchronously, on campus, or at a distance'. The same author made the following suggestions regarding PBL online; namely, teaching and learning activities are driven by using an ill-structured problem or real-life scenario; group members are actively involved in critical discourse online; an online 'e-facilitator' guides the students in their learning activities; the lecturer employs relevant strategies for individual and group learning; and four to six students are involved as members to construct new knowledge (Savin-Baden 2007:35). However, when Bessa et al. (2019) investigated the use of PBL in VLEs in higher education, they found that most virtual learning is lecturer-centred and that students experience difficulty interacting with each other. They explain that structuring and presentation of learning are generally according to the lecturer's 'fixed' ideas and as a result, students are not necessarily engaged in and actively involved in the learning process (Bessa et al. 2019:457). The fact that students are present in an online environment does not necessarily mean that they are actively participating in PBL activities. In this regard, Garrison, Anderson and Archer (2000) highlight in their conceptual framework aspects such as teaching presence, social presence, and cognitive presence as crucial in online learning platforms. Therefore, PBL has to be meaningful, foster student active engagement in the learning process, and develop students' SDL. The following research question guided this investigation: how can PBL be structured for a virtual space to promote students' active learning?

To address this problem and contribute to answering the research question, the principles for PBL in face-to-face interactions (Table 7.1) were used as a point of departure. These PBL principles were considered as to if and how they could be adapted to foster active and self-directed online learning in a virtual space.

■ Adapting problem-based learning for active online learning in virtual spaces

This section explains how the PBL principles were adapted for online excursions (the two-day excursions were synchronous whilst the completion of the e-poster was asynchronous) to contribute to similar engaging, student-centred, and real-life learning experiences for students in a virtual space. We start by explaining the rationale or need for these adaptations and how it was approached (methodology). After that, we discuss how each of the 10 PBL principles derived from the literature (Table 7.1) were adapted from the face-to-face excursion to be more suitable for learning in virtual spaces.

■ Rationale for and approach to adapting problem-based learning for virtual spaces

In the past, these excursions were offered as face-to-face excursions to bridge the gap between theory in teacher preparation programmes and what happens in practice in classrooms (De Beer, Van der Walt & Bunt 2020). The purpose of the excursions was to prepare the students with life-relevant and employment-relevant learning experiences as part of their preparation as future teachers. The face-to-face excursions followed a pedagogy of play approach, utilised experiential learning, case studies, the apprenticeship of observation, and critical reflection to achieve this goal (De Beer et al. 2020). The excursions were designed to provide a safe space where students could experience, learn, and interactively discuss a variety of lessons that would be useful to prepare them for their future careers (De Beer et al. 2020). The sessions in the excursions were designed to be engaging, student-centred, and related to real-life dilemmas (PBL) to bring the learning in the excursions closer to what student-teachers might face in practice one day (De Beer et al. 2020).

Rising financial costs and the necessity to maintain social distance because of COVID-19 restrictions, however, resulted in decisions to reassess and adapt these excursions for online learning in virtual spaces. Plans had to be devised to ensure that the same interactive and meaningful learning in the face-to-face excursions would be realised in the adapted online excursions. The resultant series of adapted PBL excursions contributed to the first cycle of a longitudinal DBR study, with the purpose to develop and refine PBL for meaningful, active, and online learning in virtual spaces.

The authors of this chapter participated in the adapted PBL excursions, both in an online and physical (in-studio) capacity. They both kept reflective notes of their experiences and perceptions during these sessions. These notes were used to formulate the descriptions of the changes made to the PBL for the virtual space. The first-year BEd students who participated in the adapted PBL excursions were all invited to anonymously complete online (Google Forms) questionnaires with open-ended questions to reflect and comment on their experiences in a virtual environment (see section 'Student perceptions and inferences of problem-based learning in virtual spaces'). These two data sets were used to critically analyse the adaptations made to the PBL virtual excursions concerning each PBL design principle. The thematic analysis led to identifying strengths and areas for improvement in designing PBL for meaningful, active, and engaged online learning in virtual spaces. In subsequent cycles of the DBR, we aim to build on the strengths and improve the areas that were perceived as challenges in the first cycle.

The 10 PBL principles derived from the literature (Table 7.1) were used to scaffold the discussion of adaptations made to face-to-face excursions to make them better suited for synchronous virtual spaces.

■ Drive authentic problem-solving

The face-to-face excursions endeavoured to expose teacher students to a variety of real-world situations which teachers might encounter in practice in South African schools. It provided an abundance of learning opportunities for teacher students to apply their problem-solving skills to practical examples (Van Vuuren 2020). Several of the activities that formed part of the excursions were scaffolded around authentic problems (related to teaching in the South African context) that the group members had to analyse and discuss in order to cooperatively find solutions (Petersen, De Beer & Mentz 2020).

For the virtual excursion, a digital recording of a 'video diary of a school principal' was used to present a set of authentic problems to the students. The video segment included several issues or problems that the 'principal' encountered in 'her school', together with her comments. The problems included in the video touched on issues such as conflict between teachers, improper teacher-learner relationships, teacher bias regarding 'differentness' (e.g. a learner who has two parents of the same gender) and more. Student-teachers watched the video, then discussed in their small groups which issues they noted in the video, and then collaboratively made recommendations 'to the principal' as part of their group's feedback to the larger assembly. Therefore, the teaching-learning process in the virtual excursion was still clearly planned around a set of authentic problems that required students to apply problem-solving skills as part of their learning.

■ Facilitate student-centred learning

The original face-to-face excursion activities were designed to foster students' engagement, give them a voice, and involve them in the teaching-learning process, rather than having lecturers present it. These types of activities are referred to as engaging pedagogies. Petersen, Golightly, and Dudu (2019:145–146) define 'engaging pedagogies' as 'any inductive teaching-learning strategy such as PBL, CL, or contextualised learning, where the learners or students are actively involved in the learning process whilst developing 21st-century skills'.

Similar efforts were made to utilise engaging pedagogies in the virtual excursions. Engaging activities, such as the 'Famine and Abundance' game and 'brain breathers' (see chs. 3, 7–9), provided exciting and even fun activities in which students could participate as part of the learning process. Although not physically sharing the same space, the facilitators strived to draw the teacher students into discussions by asking questions, using the students' names (as were displayed) and keeping the process informal and non-judgemental. This provided a safe space for students to participate freely in the process and voice their opinions within the small groups, as well as through the group's spokesperson (whom they elected themselves) to the larger assembly. Within the small groups, students had the freedom to choose their spokesperson (or communication specialist) as one of the cooperative group roles (an individual who is responsible for performing a specific task) (see section 'Engaging students in problem-based learning groups to foster a sense of belonging'; cf. ch. 8). In some cases, where the spokesperson had connectivity issues when their group wanted to report back, another member stepped in to take over that role. The virtual excursions were planned to be student-centred and deeply involved them, rather than merely lecturing them.

■ Promote learning autonomy and ownership

The face-to-face excursions aimed to contribute to teacher students' professional development regarding their autonomy, competence, and relatedness, particularly through real-life dilemmas they might encounter in their careers one day (De Beer et al. 2020). Efforts to deconstruct the *apprenticeship of observation* (cf. ch. 5) of these students allowed them to progressively take ownership of their evolution in the learning process (Botha & Reyneke 2020).

By offering virtual excursions, students were exposed to professional dispositions, teacher scenarios, and case studies. For example, the 'principal' in the video encountered problems with a teacher who was always late for school. Each student was expected to engage in critical discourse and demonstrate insight into addressing such an issue. This allowed each student to make decisions and contribute to the discussion to share insights regarding real-life dilemmas.

■ Promote cooperation and communication

Cooperative learning was pertinently included in the face-to-face excursions. Data collected afterwards revealed that:

> [*S*]tudent teachers experienced that if they work together towards a common goal, it [*was*] less difficult to achieve the goal and that it also made the learning process more enjoyable.

This underscores how valuable cooperation and communication is as part of PBL (Petersen et al. 2020:141).

The virtual PBL sessions aimed to achieve similar CL by randomly allocating teacher students into small groups, using the Zoom function for break-away groups. This allowed students to communicate and cooperate whilst analysing and discussing the problems or participating in the engaging games in smaller groups of around five students. Each member was expected to contribute to group discussions. Each group then had the opportunity to provide feedback to the overall group. The facilitators called students' names to interact with and talk to them during the whole group discussions. A teaching support assistant expertly managed groups and assisted them with administrative queries, for example, if they could not navigate to their group, if some group members were 'missing', or if they had questions during the games and interactions.

■ Develop higher-order thinking

The teacher students involved in the face-to-face excursions reported that they believed that whilst carrying out the excursion activities, their active involvement therein contributed to the development of their higher-order cognitive skills (Petersen et al. 2020). In this regard, they believed that their innovation skills, critical and creative thinking skills, and problem-solving skills had improved. The students were also required to use their higher-order thinking skills to make sense of (analyse and interpret) the dilemmas used as authentic problems to guide the PBL activities (De Beer et al. 2020).

The problems or dilemmas used in the virtual excursions (such as the dramatised 'video diary of the principal' or the 'Famine and Abundance' game) were complex and related to real-life issues that students could expect to encounter in their future careers. These so-called wicked problems do not have single or straightforward solutions (Wiek et al. 2014) and require the students to critically analyse, think deeply, discuss, and debate potential solutions and how effective their suggestions might be to ameliorate these issues in practice. Higher-order thinking was therefore expected of students in the virtual excursions.

■ Promote metacognitive thinking

The face-to-face excursions aimed to develop students' awareness of their own strengths and weaknesses as part of their metacognitive development (Jagals 2020). They provided a safe space where students could become

aware of and metacognitively consider their personal biases (Sebotsa, Petersen & Speight Vaughn 2020).

Several of the engaging activities used in the virtual excursions aimed to help students realise that 'different' does not mean 'less than' – in other words, to recognise their biases and make them aware of their ignorance about their peers' and their future learners' otherness. Students were expected to realise and confront their personal biases and the role(s) they may play in their personal problem-solving processes. The facilitators invited students to attempt to 'convert' their biases into personal learning goals and then to self-directedly work on ameliorating these biases. The 'Famine and Abundance' game used in the virtual excursions is specially constructed to support recognising one's own biases and thinking about how it impacts learning. Other planned discussions in the virtual programme, such as gender issues, HIV, and AIDS, were particularly included to contribute to students' metacognitive development, particularly in identifying and confronting their own biases and how these impact how they think about issues surrounding learning. The comments and constructive feedback from facilitators in the studio and lecturers who participated online further aimed to contribute to students' metacognitive understanding of their own strengths and areas that need improvement as part of their professional development as future teachers.

■ Manage the teaching-learning environment

In the face-to-face excursions, the teaching-learning environment was constructed to offer a safe space outside students' comfort zones in an 'island situation'. Students could freely participate (without fear of judgement) to maximise their learning (Sebotsa et al. 2020). The safe space allowed students to make mistakes, learn from them, and confront and discuss their misconceptions (De Beer et al. 2020). To support this, an engaging, inclusive, and CL environment was created, specifically through the use of small, diverse groups of five students each for completing teaching-learning activities (Petersen et al. 2020).

In the online excursions, the virtual learning space was managed digitally by a team of technical experts. The technical team managed all aspects of the online learning environment using computers, applications, and software to link resources, ensuring correct information was displayed to students, adjusting sound quality, and much more. They smoothly transitioned between recorded video clips, digitally-constructed learning games (such as the 'Famine and Abundance' game), the studio where the facilitators were presenting from, and the students presenting from their Zoom (online) groups. The studio contained all the digital equipment in a 'green room' which allowed the facilitators to appear as if they were in a classroom, in a desert, or even in

Source: Photograph taken by Ian du Plessis, in the Green Room at D1 Building at the Potchefstroom Campus of North-West University, published with permission from Ian du Plessis and consent from the individuals photographed.

FIGURE 7.1: The studio ('green room') where the facilitators were presenting from.

a forest – depending on the requirements of the script – which contributed to an interesting and non-static virtual learning space. Similar to the face-to-face excursions, students were offered a safe space to openly discuss sensitive issues, make mistakes, talk and learn about different issues and cultural differences. Students chose whether they wanted to have their devices' cameras on or not, which added additional management opportunities for them in the learning environment.

◼ Integrate digital technologies and other resources

Most resources used in the face-to-face PBL activities were physical, such as pen-and-paper, printed cards, food items (for the 'Famine and Abundance' game), and video clips displayed on a screen in a communal hall. A lack of resources is a problem frequently reported by novice teachers in South Africa (Botha & Reyneke 2020). Therefore, students must be prepared with insights into utilising existing resources or generating their own resources to support their teaching in practice one day. To support

this learning, students participated in several activities based on the shoestring approach, in which simple, cheap materials are utilised as teaching resources (Petersen et al. 2020), such as constructing a sun stove from rudimentary materials.

During the virtual excursions, the facilitators demonstrated several low-cost resources which could be used for teaching purposes, such as fold scopes, puppets, simple role-play, and music. The facilitators also demonstrated a few 'magic tricks' to show students how to make teaching more interesting and meaningful, for example, using sodium polyacrylate (the chemical used in babies' diapers) to make water 'disappear'. Students discussed in their groups and reported several ideas on how a variety of resources could be developed and used in a range of school subjects and phases.

Because these excursions were held online, the students had to master some basic digital technologies, such as navigating in the Zoom environment and using device functionalities (e.g. camera and microphone) and software (opening and switching between programmes, participating in digital games and more). Support was provided by the technical team, facilitators, and teaching assistant in cases where students were struggling with software issues. In an additional offer of technical support, one of the cooperative group member roles was that of 'Tech Fundi' – whose role was to assist other group members in navigating Zoom as part of the virtual learning space (cf. ch. 8). Therefore, without necessarily being aware of this learning, students were developing knowledge and skills regarding the use of digital technologies, which they will be able to utilise in their teaching careers in future.

■ Promote knowledge integration and innovation

Student-teachers must develop content knowledge with pedagogical content knowledge (Botha & Reyneke 2020), including alternate and innovative approaches to facilitate teaching and learning in school classrooms (De Beer et al. 2020). Therefore, students in the face-to-face excursions were given several examples of interesting and unusual learner-centred activities that they could use or adapt for use in their classrooms one day. Examples of such activities included the shoestring activities, the 'Famine and Abundance' game, case studies, and the 'how HIV and AIDS spread' activity.

In the virtual excursions, the same teaching-learning activities used in the face-to-face excursion were either demonstrated by the facilitators, or video clips of the activities as they took place in the face-to-face excursions were shown. The students then had to discuss in their groups how they could develop or apply similar innovative approaches to teaching and learning in

their subjects across school phases and reported back to the larger group. Therefore, the students in the virtual space could experience the same innovative approach to teaching and learning, although they did not share the same space for face-to-face activities.

■ Plan for assessment integration and evaluation

Students in the face-to-face excursion had to compile a pen-and-paper poster or a newspaper to reflect their group's learning. The poster or newspaper had to include content or 'articles' on their reflections of how what they learned in the excursion contributed to their professional development as teachers (Petersen et al. 2020). The posters and newspapers were evaluated by a team of facilitators and analysed for content that reflected what students learned, what they found most interesting, and how they compiled the content.

A similar reflective activity was used for assessment in the PBOL (cf. ch. 10). After attending the virtual sessions, students were required to develop and make a multimodal poster showing what they had learned and how they thought it would contribute to their professional development as teachers. Students had to refer to and reflect on the authentic problems included in the 'principal's video diary' and how these could be ameliorated or resolved in practice. Detailed information and guidance on the requirements for this formal assessment were stipulated in their module study guides. Students had to complete this activity individually, not in groups, as done in the face-to-face excursions. The assessment contributed formal marks to teacher students' qualification, motivating them to complete the assessment.

The 'Student perceptions and inferences of problem-based learning in virtual spaces' section provides insights into how the teacher students perceived and experienced the adaptations toward PBOL.

■ Student perceptions and inferences of problem-based learning in virtual spaces

Students' responses on how they experienced the PBL online process were aligned according to the adapted PBL principles used for virtual learning (Table 7.2). Quotations, as based on student-teachers' feedback on 14 September 2021, are presented unedited and verbatim.

From the teacher students' responses (Table 7.2), several inferences could be drawn regarding what they experienced positively and where we needed

TABLE 7.2: Students' experiences of virtual problem-based learning.

Principle	Selected responses of students
1. Drive authentic problem-solving	• 'It was easy for our group to try and solve the problem. We all could identify different problems and we all gave several different options to how we can solve a certain problem. We also learned that there is more than one way to solve a problem and that you can merge different options together to solve a problem.' (Student teacher, female, 14 September 2021) • 'This was an exciting process as it required me to look into depth real situations that teachers come across.' (Student teacher, female, 14 September 2021) • 'Our group had a lot of good, insightful ideas on ways in which the problem could be solved. We discussed each one in length and I honestly felt the excitement in problem-solving with fellow teachers. Even though we just brainstormed, I really felt excited to find solutions to problems which could affect my future school and students.' (Student teacher, female, 14 September 2021)
2. Facilitate student-centred learning	• 'I experienced this process in a very fun and interactive way as we had to discuss as a group in order to solve the problem.' (Student teacher, female, 14 September 2021) • 'That even if we do not know each other we were still able to come together to solve these problems.' (Student teacher, female, 14 September 2021). • 'It is a lot easier in groups you can get different views from different people.' (Student teacher, female, 14 September 2021) • 'We worked on the problem as quickly as possible, each member of the group was sharing his or her opinion, then as a team we agree which opinion is more effective.' (Student teacher, female, 14 September 2021)
3. Promote learning autonomy and ownership	• 'Teamwork and also taking accountability for my work made it easy.' (Student teacher, female, 14 September 2021) • 'Personally, it was very good to hear other people's opinions and understand and see their point of view. I learned a new way of seeing and solving problems.' (Student teacher, female, 14 September 2021)
4. Promote cooperation and communication	• 'I had a fantastic group that could help me to find solutions easily.' (Student teacher, female, 14 September 2021) • 'It was very interesting to see the way other people view problems and how they come up with solutions.' (Student teacher, female, 14 September 2021) • 'It was hard, our group was not that active as expected.' (Student teacher, female, 14 September 2021) • 'I really enjoyed working with my group. We were able to set up meetings, discuss what we had to do, planned our information accordingly and were able to work together. My group was truly excellent, each and every member contributed.' (Student teacher, female, 14 September 2021) • 'Awkward. There were language barriers. Students were lacking leadership skills and did not interact with the group. In my group I was the only one speaking, trying to get them to speak as well.' (Student teacher, female, 14 September 2021) • 'It was fun and my small group was great and cooperative.' (Student teacher, female, 14 September 2021) • 'We were 6 students in our group, and only 3 of us communicated effectively. In the end, we all contributed something, at least.' (Student teacher, female, 14 September 2021)

TABLE 7.2 (cont.): Students' experiences of virtual problem-based learning.

Principle	Selected responses of students
	• 'Overall, I found the group aspect of the excursion rather frustrating, as only 2 people in my group participated in the virtual excursion at all. Although the problems we were faced with were interesting, I disliked this aspect of the excursion the most.' (Student teacher, female, 14 September 2021)
	• 'My experience with the problem-solving activity was actually fun, as it made me notice that being a teacher is all about cooperation as it was easy to find solutions, unlike working alone which was going to be a bore. Having to hear how other students think, their idea on problem-solving was exceptional.' (Student teacher, female, 14 September 2021)
	• 'My group made some suggestions for solutions for the problem, but I felt as I was the only one who made notes of the video. I had to continue to prompt my group members to answer or think of solutions with me. After a time, it became better, and they engaged with me as we build on each other's ideas.' (Student teacher, female, 14 September 2021)
	• 'Yes, I was faced with a lot of problems, the biggest one was not being able to find any group that I can do the assignment with.' (Student teacher, female, 14 September 2021)
	• 'Teamwork and also taking accountability for my work made it easy.' (Student teacher, female, 14 September 2021)
	• 'It was easy to solve those problem because I was discussing things with others, which also helps me to understand things differently when hearing other students' thoughts.' (Student teacher, female, 14 September 2021)
5. Develop higher-order thinking	• 'This process [the PBL activities] required brainstorming and good problems solving skills by effectively listening your peers' point of views.' (Student teacher, female, 14 September 2021)
	• 'Personally, it was very good to hear other people's opinions and understand and see their point of view. I learned a new way of seeing and solving problems.' (Student teacher, female, 14 September 2021)
6. Promote metacognitive thinking	• 'I was lucky to be placed with people who were good communicators regardless of the medium. It was an overall good experience.' (Student teacher, female, 14 September 2021)
	• 'I found that working in the small groups was effective in teaching us future educators and super teachers to work together to achieve a common goal, as super teachers should. We learned from each other and encouraged each other to give our best.' (Student teacher, female, 14 September 2021)
	• 'The experience was wonderful as all of us were given an opportunity to give our views and we learned that we see and understand differently however when we work together, we can get the best outcome.' (Student teacher, female, 14 September 2021)
7. Manage the teaching-learning environment	• 'It was insightful to move from the overall meeting to a smaller room, where students were randomly selected to interact with each other. It was a learning experience because no one knew or saw each other but were able to comfortably give their opinions on the problem and fill on to the different opinions given.' (Student teacher, female, 14 September 2021)
	• 'Is that time management was lacking then only a few students managed to solve the matter.' (Student teacher, female, 14 September 2021)
	• 'We had a problem with some students not finishing their assigned tasks on time and we never had a chance to solve it.' (Student teacher, female, 14 September 2021)

TABLE 7.2 (cont.): Students' experiences of virtual problem-based learning.

Principle	Selected responses of students
8. Integrate digital technologies and resources	• 'I had to look for a better connectivity because network was giving me a problem. [...] My group members were not very effective, they did not hear half the excursion because of connectivity issues.' (Student teacher, female, 14 September 2021)
	• 'It was challenging at first not being able to have discussions in person, but online platforms really made it easier also having access to Google and YouTube to access information.' (Student teacher, female, 14 September 2021)
	• 'It was an easy thing to do because we were given some time to check those videos.' (Student teacher, female, 14 September 2021)
9. Promote knowledge integration and innovation	• 'It was a great experience, I was blessed with a group of insightful, innovative and out-of-the-box group members.' (Student teacher, female, 14 September 2021)
10. Plan for assessment integration and evaluation	• 'No references to assessment in student responses.' (cf. ch. 10 on assessment of the excursion)

to plan differently for future virtual excursions. The key inferences that were made are discussed in more detail:

1. Students valued the opportunity to analyse and discuss authentic problems related to what they might experience in their teaching careers one day. One participant mentioned, 'I really felt excited to find solutions to problems which could affect my future school and students.' (BEd student, unknown gender, 15 September 2021)

2. The teacher students enjoyed the learning process; they interacted with one another and discussed possible solutions to the problems.

3. Concerning learning autonomy and ownership, students emphasised that having different opinions and taking accountability for specific tasks were valuable in contributing to their learning. As a result, students became actively involved in authentic tasks, strengthened their learning, and developed a deep understanding of challenges as outlined by Ertmer and Glazewski (2015).

4. The CL and communication aspects of the PBOL were experienced in divergent ways. Some students appreciated its positive value as part of the learning experience, noting that it was fun, contributed to diverse insights, and broadened their thinking. Group members believed that it enhanced their learning and developed cooperative group skills similar to the CPBL framework of Mohd-Yusof (2017). On the other hand, some students expressed frustration with this aspect, citing lack of participation most frequently. This finding mirrors that of Bessa et al. (2019) that, although students are online, they are not necessarily all actively involved in the learning process. Therefore, the requirements stipulated for cooperative PBL (Mohd-Yusof 2017) (see section 'Engaging students in problem-based learning groups to foster a sense of belonging') need to be carefully considered and effected to overcome these issues.

5. The problem-based activities and scenarios used in the virtual excursion contributed to teacher students' analysis, problem-solving, and evaluation skills.

6. Students reflected on their group work as an overall positive and valuable experience as it provided a better understanding of the contexts and challenges involved in teaching. One participant mentions: 'I found that working in the small groups was effective in teaching us ... to work together to achieve a common goal, as super-teachers should. We learned from each other and encouraged each other to give our best'.

7. The virtual environment was experienced as a safe space for learning. However, it emerged that time management was experienced as challenging. This issue emerged despite planning the virtual excursion to include synchronised sessions, where the whole assembly was gathered at once, interspersed with timed sessions where teacher students broke away to complete activities on their own followed by small-group discussions in their online break-away rooms.

8. It seems that students are divided about using digital communication, where some did not mind using it, whilst others did not like it. Although some had Internet connection problems, access to the resources on the digital platform was experienced as a positive contribution to the overall process.

9. The manner in which the PBOL was scaffolded resulted in the enjoyment of learning as indicated: 'it was a great experience', as well as 'innovative and out-of-the-box' thinking and ideas which teacher students could utilise in their future careers.

10. No feedback was received from students regarding assessment as part of PBOL. This is probably because the data were collected before students completed their assignments.

Overall, students' responses reflected that they experienced PBL in a virtual space as positive, and most students were actively involved. In some instances, cooperation amongst group members was a challenge. Based on the above analysis and these findings, the following recommendations are made.

■ Reflective points and recommendations

We make the following recommendations for subsequent cycles of implementing PBL in a virtual space:

• The virtual excursions provided for student engagement and active learning by selecting an appropriate problem that drives the learning and requires the co-construction of knowledge. This is a vital element for inclusion in any subsequent cycles of implementation of PBL in virtual space. We support and recommend the continued use of topics based on different disciplines (e.g. STEAM [HIV and AIDS] as well as social sciences [using

virtual passports in the 'Famine and Abundance' game]), as was done with the first cycle of virtual excursions.

- Student-teachers should also be allowed to note the problems they experienced in school themselves (possibly using an anonymous platform) to increase student voice in this virtual learning experience.

- Cooperative learning needs to be planned and implemented carefully – every student must be 'present', participate, and contribute to the discussions in the group. This was achieved by introducing cooperative principles to students before starting with the PBL activities. This is another vital element that should be constant in subsequent implementation cycles. We additionally suggest using online tools such as classroom polling and quizzes, where applicable, to support students' active online learning and follow up on their understanding of a specific topic.

- Time management skills must be refined and addressed at the start of the virtual excursion. Because students are not used to self-regulation of time, they might need more guidance in developing this skill to ensure they keep up and manage all the planned activities in the virtual excursion, especially when the activities are synchronous. In terms of well-being, students may become exhausted and experience online fatigue. As such, we suggest that regular 10-min breaks be provided where students can be involved in a written problem-solving activity about which they should then provide feedback online. Members may then be asked to share their screens as evidence of the work they have done. The 'brain breather' activities that were already incorporated in the first cycle of PBOL were highly effective in this regard.

- Group members have to assess each other's online cooperation and contribution to the group to promote all students' active learning. After completing a task, the facilitator has to be involved and summarise the learning, as was done in the first cycle. Nonverbal feedback can also be given where students are clicking on relevant icons. Members may consider using forum tools to reflect on their learning.

- Although educational assistants supported technical aspects in the virtual excursions, it is recommended that in subsequent implementation cycles, the facilitator(s) engage and more regularly visit break-away rooms to guide students where necessary and be more personally involved in their learning. The facilitators may consider using tutors (senior students) for additional support in break-away rooms. It is also suggested that the facilitators back up the recording in case students arrive late for specific sessions or have connectivity issues.

- As was done in this first cycle, we recommend that in subsequent implementation cycles, efforts are made to keep virtual groups the same for the duration of working on a particular PBL task (both synchronous and asynchronous learning). When a member has to leave the break-away room for the task's duration, the group has to continue and consider reassigning problem-based tasks to the remaining members.

■ Conclusion

This chapter aimed to explore how PBL can be adapted for online learning in virtual spaces to promote teacher students' active participation and meaningful learning in real-world problems and teaching scenarios. Several design principles used to construct PBL activities have been derived from literature and adapted for online learning. As part of this preliminary investigation, qualitative responses from students who participated in the first cycle of the adapted PBOL provided more profound insights into their virtual learning environment experiences. The initial findings indicated that students experienced PBOL as positive, and most students were actively involved. In some instances, however, cooperation between group members was a challenge. Based on the findings, recommendations were formulated to be implemented in the second cycle of the longitudinal design-based study.

Chapter 8

Students' experiences of cooperative learning in a virtual excursion

Anitia Lubbe
Research Unit Self-Directed Learning,
Faculty of Education, North-West University,
Potchefstroom, South Africa

Neal Petersen
Research Unit Self-Directed Learning,
Faculty of Education, North-West University,
Potchefstroom, South Africa

■ Abstract

The ability to think critically, solve problems, and communicate and collaborate effectively are some of the crucial SDL skills students need as part of their repertoire for the 21st century and beyond. Students are no longer required to be passive recipients of knowledge, but rather active participants in their own knowledge construction. This social constructivist stance necessitates the use of more engaging teaching and learning pedagogies, more so during online learning endeavours where students are socially and physically apart. Cooperative learning is an instructional pedagogy that supports the social

constructivist approaches as stated by Lev Vygotsky. To establish an online workspace where students can promote each other's learning within a group, the elements inherent to CL were explicitly built into all activities which formed part of the virtual WIL excursion. Preliminary data suggests that students perceived the way in which CL was scaffolded during the excursions as valuable towards their learning, as well as to their social competencies. The contribution towards their future teaching careers was also highlighted.

◼ Introduction

Various developments, including globalisation and an increase in the knowledge economy, are the driving force behind the need for more autonomous learners, capable of directing their own learning. According to Johnson et al. (2014), the ability to think critically, communicate, and collaborate effectively are becoming increasingly important for the development of the next generation's innovators and creative thinkers. Traditional teaching pedagogies are not conducive for the development of skills needed to direct one's own learning (Biggs & Tang 2011; Saavedra & Opfer 2012). Cooperative learning is an alternative, innovative instructional pedagogy that suggests meeting this purpose (Bosch 2017; Breed 2016; Hammond & Collins 2013; Loh & Teo 2017; Mentz & Van Zyl 2018).

Student excursions have been suggested to be critical for introducing students to their role in society (Nespor 2000), specifically within preservice teacher training (De Beer & Henning 2011). Furthermore, De Beer, Petersen, and Dubar-Krige (2011:20) state that excursions 'offer a unique augmenting opportunity for our students to identify, interrogate, and work towards changing their unarticulated practices and prejudices, before they enter the profession as teachers'. Within the current COVID-19-ridden educational environment, preservice teacher excursions at NWU were reconceptualised for the virtual environment (cf. ch. 3). In this chapter, the authors consider how the elements of CL could be structured during a virtual excursion.

◼ Problem statement

Excursions are ideal settings in which students can learn whilst manoeuvring through unexpected sociocultural disequilibrium (De Beer et al. 2011). De Beer and Henning (2011) show how face-to-face excursions are opportunities for dramatical collisions (Veresov 2007) to emerge, which scaffold learning across the ZPD (Vygotsky 1978). *Will this also be the case for virtual excursions?* Our aim was to develop new insights into students' experiences of CL within virtual excursions, as well as to introduce possible considerations for the structuring of online CL groups that can guide future research in this area. The question that directed this research was: *what are the first-year students' experience of CL during virtual excursions?*

■ Conceptual and theoretical framework

The definition, elements, and benefits of CL will be discussed, as well as an outline of the implementation of CL in virtual environments by highlighting key considerations from the literature. Lastly, the authors will outline the theoretical underpinnings of this research.

■ Cooperative learning

□ Definition

In its broadest sense, CL is defined as a pedagogical practice during which students work in small groups to accomplish a mutual goal (Gillies & Boyle 2010; Johnson, Johnson & Holubec 2013). With that said, it is important to highlight that not all small group efforts are cooperative in nature. Cooperative learning efforts are set apart by the inclusion of the following basic elements: positive interdependence, individual accountability, promotive interaction, small group and social skills, as well as group processing (Gillies 2016; Johnson & Johnson 2015). The inclusion of these basic elements will enable students to have a sense of individual accountability towards the groups, which means that the group's success is dependent on each group member's individual success (Johnson et al. 2013).

□ Elements of cooperative learning

The five basic elements of CL are the heartbeat of cooperation within small groups (Lubbe 2020). Failing to purposefully structure these elements within small groups will cause group members to either be in competition with fellow group members, or that group members will be highly individualistic and work alone (Johnson & Johnson 2014b).

According to Deutsch (1949), CL efforts are centred around positive interdependence, and the 'sink or swim together' principle describes this best (Johnson & Johnson 2013). Johnson and Johnson (2014b) state that positive interdependence is:

> [*T*]he perception that one is linked with others in a way so that one cannot succeed unless they do (and vice versa) and that groupmates' work benefits you and your work benefits them. (p. 845)

Positive interdependence can be structured in a number of ways, including (Johnson & Johnson 2013):

1. **Positive goal interdependence** – exists when group members realise that their own learning goals can only be achieved if all group members achieve theirs. This can be ensured when groups are setting mutual goals.

2. **Positive reward interdependence** – exists when each group member receives the same reward(s) when the group achieves its mutually set goal and can be structured by allocating mutual rewards for successful groups.
3. **Positive resource interdependence** – exists when group members are interdependent for resources, information, as well as other materials needed to complete their tasks. This is present when each group member has a part of the information, and when all the group members' information should be combined for the group to complete their task and to achieve their goal.
4. **Positive role interdependence** – exists when each group member is assigned a specific complementary and interconnected role. This will ensure that specific responsibilities within the group are linked to the set roles.
5. **Positive task interdependence** – exists when the tasks or work is sequentially organised, allowing the group members to grasp that success depends on the whole group and not on individuals within the group.
6. **Positive identity interdependence** – exists when the group agrees upon a common identity and can be structured through a group name or motto.

Although successful cooperation within a group relies heavily on group members being positively interdependent on each other, individual group members should still take ownership of their own contribution and be accountable for their part of the task.

According to Tran (2013), 'individual accountability is considered as the degree to which the achievement of the group is dependent on the individual learning of all group members'. Therefore, each individual group member is stronger in their own right and should be able to complete a similar task on their own after they have participated in the cooperative task (Johnson & Johnson 2013). Individual accountability can be structured in several ways, including, (1) ensuring that groups are small because smaller groups will lessen the chance for social loafing, (2) giving individual assessments to students, (3) randomly selecting students to answer questions or to present their work, and (4) having students explain what they have learned to someone else (Johnson & Johnson 2013). It is worth mentioning that, according to Millis (ed. 2010:5), individual accountability is the most 'abused' CL element. However, when each group member's contribution towards the task is taken into account when the group's task grade is calculated, 'social loafing' is prevented (ed. Millis 2010:5).

Promotive interaction exists when there is verbal interaction required between group members (Johnson et al. 2013). According to Johnson and Johnson (2014b), 'students promote each other's success by helping, assisting, supporting, encouraging, and praising each other's efforts to learn'. This is achieved through students giving and receiving feedback, exchanging ideas and information, encouraging each other's efforts to achieve, promoting the

interpersonal skills needed for effective communication, as well as processing the effectiveness of the group (Johnson et al. 2013).

Amongst others, small group and social skills entail the ability to (1) listen actively, (2) comment constructively, (3) share ideas, resources, and information, and (4) reach democratic consensus (Gillies 2016). Because CL will not be effective in the absence of socially skilled group members, social skills such as '[l]eadership, decision-making, trust-building, communication, and conflict-management skills have to be taught just as purposefully and precisely as academic skills' (Johnson & Johnson 2014b:845). Furthermore, effective social skills not only promote higher achievement within CL groups but also contribute towards positive relationships amongst group members (Tran 2013).

'Group processing is arguably the pivotal element when implementing CL with students' (Sutherland et al. 2019:22). It is important to enable groups to clarify the teamwork dynamics in order to improve the efficiency of each member's contribution towards the CL tasks and ultimately the achievement of mutual goals (Tran 2013).

To summarise, when these five basic CL elements are explicitly structured within cooperative groups, there will be an increase in student achievement, deeper learning, and positive interpersonal relationships (Johnson et al. 2013).

☐ Benefits of cooperative learning

Much research has been done about the influence of CL and, according to Loh and Ang (2020), the benefits of CL can be categorised into academic benefits, affective benefits, and benefits relating to social competence.

According to Loh and Ang (2020:25), 'the academic benefits involve knowledge acquisitions and growth in intellectual and academic skills'. Because students are active participants during CL activities, as opposed to passive recipients, the following are related academic benefits:

1. Deep comprehension (Cavanagh 2011; Shimazoe & Aldrich 2010; Wyk 2012).
2. Increased knowledge retention as a result of positive attitudes towards learning (Johnson et al. 2014; Shimazoe & Aldrich 2010).
3. Ability to analyse problems from more than one perspective (Loh & Ang 2020).
4. Learning through peer interaction (Johnson et al. 2014; Johnson, Johnson & Stanne 2000; Lubbe 2015).
5. Expand students' existing ZPD to the higher potential level (Loh & Ang 2020).
6. Increased critical thinking as a result of mutual sharing of ideas and opinions (Gillies 2003; Slavin 2012).
7. Broader perspectives (Cavanagh 2011; Shimazoe & Aldrich 2010).
8. Increased performance (Colak 2015; Du 2015; Slavin 2014).

9. The emotional aspects of learning are included in the affective benefits of CL. Such emotional aspects include: appreciation, enthusiasm, motivation, as well as values that promote greater involvement, commitment, as well as ownership of one's learning (Du 2015).

10. Increased commitment towards their own and their group's learning goals (Carcolini 2017; James 2018; Seng 2014).

11. Increased feelings of empowerment, self-efficacy, self-esteem, as well as satisfaction (Cavanagh 2011; Slavin 2014).

12. Increased self-directedness towards learning (Lubbe 2015, 2019; Thanh, Gillies & Renshaw 2008).

13. Increased motivation and joy of learning (Du 2015; Johnson et al. 2014).

The ability to 'get along with others in acceptable and appropriate ways' (Loh & Ang 2020:26), constitutes the social competence benefits of CL. These include the increased ability to get along with others (Felder & Brent 2007), enabling students to interact in a variety of ways (Loh & Ang 2020), increased social skills (Cavanagh 2011; Johnson & Johnson 2014b; Lubbe 2015, 2019), increased ability to view things from multiple perspectives (Lim 2004; Yager 2000), as well as increased ability to respect others' opinions (Cavanagh 2011; Johnson & Johnson 2014b; Slavin 2014).

Despite the overwhelming evidence of the positive effects of CL on students' learning, the implementation thereof seems to be a cause for concern for educators (Gillies & Boyle 2010; Veldman et al. 2020).

Cooperative learning in a virtual environment

Needless to say, whether CL is implemented in a traditional face-to-face or a virtual environment, the purposeful structuring of the CL elements is not negotiable. Furthermore, Swan, Shen and Hiltz (2006) noted that increasing positive interdependence in online CL groups will contribute to the success thereof. Within a third-world context, however, Internet connectivity and the availability of appropriate devices (e.g. laptops and smartphones) might be a contributing factor towards the complexity of online CL implementation.

Theoretical underpinnings

It is now a universal phenomenon that all institutions had to, or are in the process of, or plan to make certain adaptations to fulfil their mandates after COVID-19 reached across the globe with all its might and force. This is also true for all HEIs, like universities, all over the world and in South Africa. The NWU is no exception, and the designers of the education excursion, usually presented in a face-to-face mode, had to redesign the excursion programme to present it virtually. Yakubu and Dasuki (2021:248) refer to this migration as 'emergency online teaching and learning'. Online teaching and learning faced

many challenges (Adedoyin & Soykan 2020). This is particularly relevant to developing countries such as Nigeria (Yakubu & Dasuki 2021), and we can add South Africa as well. These challenges include poor connectivity, little or no data, low ICT-competency, and lack of devices (Yakubu & Dasuki 2021). Indeed, during the excursion, the participating student-teachers experienced these challenges as a reality. Gedera and Williams (2013) argue that these challenges can be regarded as 'conflicts, contradictions, miscommunication and misunderstanding in learning systems that can affect students' participation in e-learning activities'. The presence of conflicts and contradictions are fundamentally part of the fibre of an activity system, as coined by Engeström (1987), and hold opportunities for growth and development. Activity theory or CHAT is therefore a suitable heuristic to analyse and give meaning to the student-teachers' experiences about CL during the excursion.

Cultural-historical activity theory, deeply rooted in the social constructivist ideas of Soviet (Russian) researchers such as Vygotsky (1978) and Leontiev (1978), can be used as a versatile tool, theory, or heuristic to describe phenomena in social research (Yakubu & Dasuki 2021). Hashim and Jones (2007:n.p.) define activity theory as 'a theoretical framework for the analysis and understanding of human interaction through their use of tools and artefacts'. The activity system (Engeström 1987) consists of six interrelated elements, namely the subject (participants engaging in the activity), the object (as the focus and purpose of the activity), the tools (artefacts) mediating the activity, the rules that guide the activity, the community (all other participants playing a role in the activity), and the division of labour which suggests the hierarchical structure and role clarification in the activity. The core of the activity is represented by the inter-relation between the subject and the object to reach the intended (and unintended) outcome(s) (Hasan & Kazlauskas 2014). The 'activity' in 'activity theory' signifies the unit of analysis (Hasan & Kazlauskas 2014) and is in this study represented by the student teacher's participation in the activities of the excursion in a CL setting. Figure 8.1 depicts the activity system of the first-year BEd students during the excursion.

Based on the work of Rogoff (1995), Mentz and De Beer (2017) describe the versatility of CHAT as a research tool and describe how it can be used on a personal plane, on an interpersonal plane, and on an institutional plane. In this chapter, CHAT is used on the more conventional personal plane where the focus is on the individual subject, in this case on the first-year BEd student. In the discussion part of this chapter, CHAT on a personal plane will be used to emphasise the positive relations and to identify the possible tensions that the students might experience whilst working in a CL setting and how the tensions hold affordances for the students' self-directedness and sense of belonging.
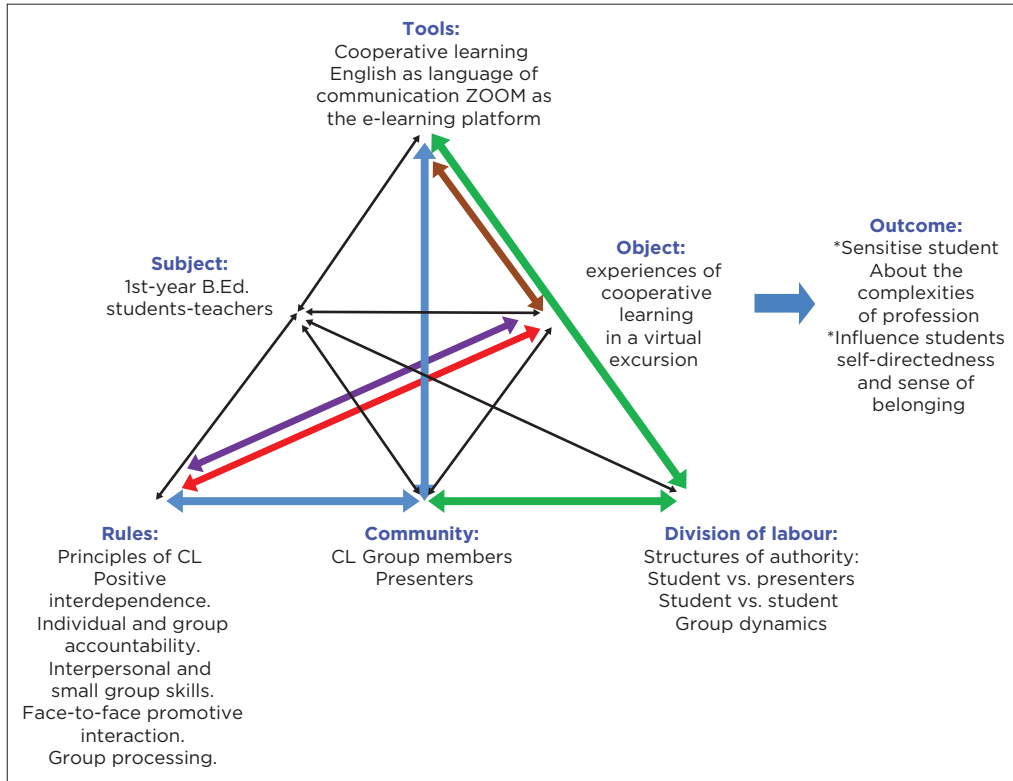
Source: Based on De Beer and Mentz (2019:57).
Key: CL, cooperative learning.
FIGURE 8.1: Activity system of the first-year BEd students during the virtual excursion.

Research methodology

Research paradigm

A qualitative research design, within an interpretivist paradigm, underpinned this research to find answers to the research questions reported in this chapter. An important tenet of interpretivism is that it is socially constructed with the aim to understand and interpret what the participants are thinking about the phenomenon researched (Kivunja & Kuyini 2017). Both the qualitative design and the interpretivist paradigm are suitable for this study where the researchers have the objective to understand the first-year BEd students' experiences of CL.

Research design

Merriam (2009:23) describes that qualitative research has the objective to understand (1) how people interpret their experiences, (2) how they construct

their worlds, and (3) what meaning they attribute to their experiences. The way in which CL was scaffolded during this virtual WIL excursion is driving this qualitative research. Qualitative data from students' feedback on their experiences of CL, as well as from students' self-assessments, were analysed in order to present practical guidelines in terms of future virtual WIL excursions.

First-year students were randomly assigned to diverse online CL groups of five students for the duration of a 2-day virtual excursion. In most cases, students of different NWU campuses were divided into the same CL groups. In line with the five basic elements of CL (Johnson & Johnson 2013; Johnson et al. 2013), Tables 8.1 and 8.2, respectively, outline the way in which the cooperative nature of the virtual excursion was conceptualised, as well as the group roles.

TABLE 8.1: Cooperative learning principles within cooperative learning excursion groups.

Principles	Learning excursion groups
Positive interdependence	1. Groups were kept small (maximum of 5 students per group)
	2. One task per group (designing and creating of self-directed learning multimodal e-poster)
	3. The designing of the e-poster based on an authentic problem which had to be solved
	4. All other group activities were authentic
	5. Group roles (Materials Manager, Quality Controller, Organiser, Communication Specialist and Tech Fundi) were assigned
	6. The roles were rotated for each activity
	7. Groups reported back after each activity
Individual accountability	1. Groups were kept small (maximum of five students per group)
	2. Group roles (Materials Manager, Quality Controller, Organiser, Communication Specialist and Tech Fundi) and group roles were rotated for each activity
	3. Peer assessment (contributed towards final mark)
	4. Self-assessment (contributed towards final mark)
Promotive interaction	1. Groups were kept small (maximum of five students per group)
	2. Interconnectedness of the group roles (Materials Manager, Quality Controller, Organiser, Communication Specialist, and Tech Fundi)
	3. Discussions and brainstorming sessions during break-away sessions
	4. Authentic activities
	5. Groups reported back after each activity
Small-group social skills	1. Discussions and brainstorming sessions during break-away sessions
	2. One e-poster per group
	3. Group roles were explained in an online video to the students
	4. Rotating of group roles enabled all students to report back during plenary sessions
	5. Interconnectedness of the group roles
	6. Democratic consensus had to be reached for report back during plenary sessions
Group processing	1. Discussions and brainstorming sessions during break-away sessions
	2. Cooperative learning was explained during an online video to the students
	3. Assistance by senior students as facilitators during break-away sessions
	4. Feedback during plenary sessions, facilitated by presenters
	5. Poll questions throughout the excursion
	6. Encouraging students to post chats in the chat function
	7. Encouraging students to elaborate on their feedback during plenary sessions

Source: Based on the work of Johnson and Johnson (2014a).

TABLE 8.2: Cooperative learning excursion group roles.

Group Characteristics	Materials Manager	Quality Controller	Organiser	Communication Specialist	Tech Fundi
	1. Active participant 2. Responsible to upload documents to Google Forms on behalf of the group 3. Takes notes during the discussions to assist the **Communication Specialist** to provide feedback, and for later use when compiling the e-poster 4. Should sign the Confidentiality Agreement 5. In collaboration with the **Organiser** and **Communication Specialist**, keeps group on schedule, accomplishing everything in a timely manner during the discussions and whilst compiling the e-poster	1. Active participant 2. Never settles for 'good enough' 3. Make sure all students' work meets the success criteria 4. Checks that objectives, outcomes, and aims are met and aligned with the rubric 5. Assists the **Materials Manager** and takes responsibility for checking that all members completed their self-assessment AND that the group's peer assessment is done 6. Responsible for collecting images from group members for the e-poster 7. Responsible to ensure that the correct images are used (Image Copyright)	1. Active participant 2. Gets the group off to a quick start by leading the discussions 3. Keeps the group on task 4. Ensure work is done by all, and provide feedback about this to the **Communication Specialist** 5. Make sure all have the opportunity to participate and that every voice is heard 6. Takes care of good relations between group members 7. Make sure that all members understand the instructions of the excursion activities, as well as the e-posters 8. With the assistance of the **Tech Fundi** and **Quality Controller**, it is your responsibility to assist with the layout of the poster	1. Active participant 2. Share a summary of cooperative learning excursion groups with the large group. Speaks for the group and not from a personal view 3. Responsible to ask questions on behalf of the group for clarity 4. Responsible for scheduling regular meetings on the communication platform which the **Tech Fundi** set up 5. Assists the **Quality Controller** in making sure that the group agrees on the content of the e-poster before the **Materials Manager** submits it on Google Forms 6. Liaison between group members (should documents be exchanged for peer assessment) 7. Responsible for keeping a record of every member's contribution towards the discussions/work 8. Responsible for keeping a record of all communication in terms of attendance to online meetings/discussions	1. Active participant 2. Responsible for setting up communications platform(s) to assist the **Communication Specialist** (if requested by the Communication Specialist) 3. Assist the **Materials Manager** in uploading of documents 4. Assist group members who might be struggling with Google Forms and technical mishaps relating to the e-poster 5. Responsible for collating all members' contributions

Source: Business vectors created by Macrovector. Text by Anitia Lubbe and Neal Petersen.

Evident from Table 8.1 is the explicit inclusion of the five basic CL elements. The inclusion of authentic activities throughout the two-day excursions, as well as the authentic problem to be solved for the self-directed multimodal assessment poster (cf. ch. 10), ensured positive interdependence, individual accountability, as well as promotive interaction. The group roles played a major part in the online excursion, not only to promote positive interdependence and individual accountability but also to ensure that students had the opportunity to develop much-needed social skills. Because the majority of the first-year students might not have been exposed to any form of CL, students had to be supported in their CL endeavours. This was done by means of: (1) an electronic document contained clear instructions on the way in which the CL activities were to take place, (2) students were instructed to rotate roles for each of the online CL activities so that they would be able to select the most appropriate group role for the assessment, (3) a short video on the nature of CL was compiled and played to the students at the beginning of the excursion, (4) to encourage student engagement and reflection, short poll questions were included throughout the two-day excursion, (5) assistance by senior students as facilitators was available during the break-away sessions, and (6) an assistant was readily available throughout the two-day period to assist with any logistical issues related to CL activities.

Table 8.2 outlines the group roles which was implemented during the excursion. Noteworthy is the interconnectedness of the group roles, which were explicitly structured to strengthen promotive interaction amongst group members. The nature of the group roles, as well as the interconnectedness thereof, furthermore, provided a platform for students to develop small-group social skills. Furthermore, it is evident that thorough planning is necessary for the implementation of CL in a virtual space. Because students are not in the same physical space and might feel separated from the group, ensuring positive interdependence is key. Furthermore, each of the CL group roles were conceptualised with interdependence at its core. This means that each of the group members had to select the role which best suited their personalities, strengths, and weaknesses so as to best contribute towards the mutual group goal – compiling the e-poster.

Moreover, the implementation of CL was extended to the assessment of the excursion by making use of e-posters as a self-directed multimodal assessment instrument (cf. Chapter 10).

◼ Research ethics and considerations

This chapter reports on the research findings of a larger project with the following research ethics clearance number: NWU-00487-17-A2. National and institutional ethics regulations were adhered to throughout the research process. We obtained ethical clearance from the university's relevant ethics

committee, after which gatekeeper's permission was also obtained. Thereafter, data were gathered. Only data gathered from participants who provided informed consent were analysed. Although all first-year preservice teachers at the university where this research was conducted took part in the virtual excursions, participating in the research was totally voluntary. To this end, participants could withdraw from the research at any time without consequences. Recruitment of participants, as well as obtaining informed consent, was handled by an independent person. Privacy and confidentiality of all participants were ensured.

▪ Sampling and data collection

Because all the data which were gathered from the participants were used, a convenience sampling method was used (Tracy 2020). The data consist of a total of 245 completed open-ended questionnaires and 66 open-ended poll questions from respondents who provided informed consent for the usage of their data.

The open-ended questionnaires are the self-assessments which formed part of the final assessment of the excursion (cf. ch. 10). However, only data pertaining to CL were included. Therefore, the following questions were relevant: 'the excursion was …' (Question 1) and 'I think cooperative learning …' (Question 8). The open-ended poll question included is: 'tell us about your experiences in your small group, and the collaboration between the students' (Poll question).

▪ Data analysis

After the data had been gathered and anonymised, the data were analysed with the aid of ATLAS.ti™ (Version 9). In line with Saldaña (2009), data analysis was done inductively by means of codes and themes. Our interpretation and understanding of the data about the student teachers' experiences of CL will be presented by means of a thick description (Henning, Van Rensburg & Smit 2004).

▪ Trustworthiness

In order to contribute to the trustworthiness of this study, the different data sources (open-ended questions and the opinion poll questions) were triangulated to ensure the credibility of the research findings (Patton 2002). The trustworthiness was further strengthened by investigator triangulation, in which more than one researcher is involved to mitigate the influence that one researcher may have on the findings of the study (Denzin 2009). Two researchers worked closely together on this research, therefore adding to the credibility. Although more than 2 000 student-teachers attended the excursion,

only 245 gave their consent to use the data. Because of the relatively small sample, we cannot therefore generalise the findings. The findings of this study can however provide an overall picture of what can be expected from online excursions when CL is included as explained in this chapter.

■ Findings

Using the data from the relevant self-assessment questions, as well as the open-ended poll question, we draw attention to the following themes: enhanced learning, enhanced social competency, influence on future teaching career, sense of belonging, as well as issues with CL group dynamics.

■ Theme: Enhanced learning

Evident from participant responses is that students perceived their involvement in CL groups as beneficial towards their learning. Not only did the group dynamics of the CL groups ensure knowledge retention, but students also experienced it to be an effective teaching and learning strategy, even in the online environment. The following response of one of the participants encapsulating this finding very well:

> '[…] it [*cooperative learning*] makes learning easier and ensures that the concepts learnt are kept and stored successfully in the brain. Alone we can do so little; together we can do so much.' (Student, Question 8, Group 79)

Other relevant participant responses to support the finding that CL groups enhanced the learning are:

> '[…] when we are in groups we get to learn a lot from each other, and we gain knowledge of things that we were not aware of before.' (Student, Question 8, Group 1)

> '[*CL*] Promotes active learning which keeps the learner engaged and helps learners remember more.' (Student, Question 8, Group 48)

> 'It was very nice interacting with students from different campuses. I got to make friends that I really feel like are beneficial to me in terms of academic excellence because they were really smart. I feel like I could learn a thing or two from them. I also got to understand the importance of teamwork and also improve my leadership style.' (Student, Poll question, Respondent 55)

> 'I think CL is necessary, even if we don't like it, because it teaches everyone to take responsibility and work together.' (Student, Question 8, Group 13)

Noteworthy is that students linked their knowledge gain to the positive interdependence within their CL groups. The structured positive interdependence within the CL groups provided students with the opportunity to share ideas and therefore provided a platform for students to learn from each other. In this context, the following participant responses were relevant:

> 'It enables students to actively participate in a given task with their respective students and also learn a thing or two from one another.' (Student, Question 8, Group 112)

'I learned a lot from my fellow students during the discussions. The whole experience was eye-opening because I had to hear other students' opinions on certain things.' (Student, Question 1, Group 99)

'It's [*cooperative learning*] good because it helps students depend on each other for tasks and it enables them to understand their teammates.' (Student, Question 8, Group 133)

'At first, I didn't have nice feelings about cooperative learning. I'm that person who wants to work alone. But cooperative learning changed that. Cooperative learning revealed to me the importance of interacting with fellow colleagues and sharing constructive ideas to make the work easier.' (Student, Question 8, Group 148)

■ Theme: Enhanced social competency

Although the excursion took place in a virtual environment, with students not being in the same physical space and not able to work face-to-face, the CL seems to have been successful in the promotion of social competency. Students enjoyed meeting new people, learning from them, as well as sharing their ideas with one another. The following quotations were relevant in this regard:

'It was really amazing to see how students from all over the country came together, took self-initiative and participated hands-on!! In our group, we had another girl from *Potch* who did not speak English as fluently as the rest, because Afrikaans is her mother-tongue, but she took part in all the discussions and whenever she got stuck, the whole group worked together to guide her. In every discussion, each student contributed their own personal thoughts and experiences and it elaborated on each one.' (Student, Poll question, Respondent 7)

'Cooperative learning is a great way where one learns about their strengths and weaknesses, and it also gives one an opportunity to learn from others. In addition, it encourages a person to be considerate of others and to listen and to be willing to share ideas with their teammates.' (Student, Question 8, Group 6)

'It [*cooperative learning*] was also such a great experience having to communicate with other students from different campuses.' (Student, Question 1, Group 31)

'I found it [*cooperative learning*] to be extremely interactive even though it was online, this definitely made my online year of studies more memorable and it was also really nice to interact with my fellow future teachers and hear their interesting […] opinions.' (Student, Question 1, Group 72)

Furthermore, the participants indicated that the heterogeneous nature of the CL groups were appreciated and perceived as vital for social skills development.

'I had fun listening to everyone's creative ideas and how their minds work. It was very entertaining. I loved the awkward moments when the mic [*microphone*] was muted and they had to start speaking all over again. It was fun being able to interact with students that are studying a different phase than what I am.' (Student, Question 1, Group 9)

'Cooperative learning does have advantages, for example working together with different people gives different insights.' (Student, Question 8, Group 33)

'Is very important as it [*cooperative learning*] teaches us to work together with people from different cultures, races, and backgrounds. And this prepares us for working in real life where we will be surrounded by unique and talented people who we need to learn to work with.' (Student, Question 8, Group 61)

'[…] and cooperative learning helps to take students out of their comfort zone and improve communication skills as it requires you to communicate with students you have never encountered before in your life.' (Student, Question 8, Group 114)

'Considering the challenge of not meeting team members in person and the challenge that goes with that, it [*cooperative learning*] is a positive and fulfilling experience because I was able to grow.' (Student, Question 8, Group 54)

■ Theme: Influence on a future teaching career

The participants' involvement in the virtual CL groups also seems to have the potential to influence their future learning and teaching career. Participants specifically highlighted the importance of the authenticity of the learning experience in this regard:

'My social skills, communication skills, computer skills, and professional skills were developed.' (Student, Question 8, Group 54)

'A great experience to get to know fellow students studying education and to help me grow by hearing what other students had to say and to relate to that as well as […] it helped to set the foundation for my four years of study.' (Student, Question 1, Group 119)

'Life-changing experience for my career and it gave me a chance to work with fellow students on issues and solutions affecting teaching and learning. One day when I'm a teacher, I will reflect on my experiences from this excursion.' (Student, Question 1, Group 18)

'The excursion was very informative, we got to meet fellow future teachers and also discuss matters that will affect us in future […].' (Student, Question 1, Group 10)

'I think cooperative learning is important as a student teacher, because when we start working at a school we have to work with other teachers, HODs [*heads of departments*], and the school management.' (Student, Question 8, Group 62)

'[…] in the end, it [*cooperative learning*] allows us the opportunity to work with different people with different opinions and ways of thinking. In the work field we will be working amongst different people with different personalities, and this allows us to learn how to navigate through conflict and difference in opinions in a safe environment.' (Student, Question 8, Group 23)

'Brilliant. First-years generally struggle adjusting to the platform where we aren't told in a variety of detail what we need to do. Cooperative learning gives us the chance to catch information that may have been missed otherwise, and additionally prepares us for a work environment where we will have to work with a teaching body to complete certain tasks to maximise discipline in a school.' (Student, Question 8, Group 85)

It is evident that the participants valued the CL groups as contributing to much-needed skills necessary for their future learning, as well as their teaching

career. More specifically, the need to work together and also to be sensitive with regard to the complexities of the teaching profession, as they realised that they need to work with different people with different personalities and opinions. We argue that this positive experience of the student-teachers can be partly attributed to the fact that effective scaffolding took place during the learning opportunities, within the students' ZPD.

◾ Theme: Sense of belonging

The participants indicated that their involvement in the CL groups within this virtual excursion gave them a sense of belonging and togetherness. Participants valued being part of a team that contributed to each other's success and formed a learning community.

Evident from the participants' responses is that the sense of belonging within the CL groups enabled them to become friends outside the virtual excursion environment.

'It was really nice meeting students from other campuses. Some have become good friends [*that*] I can call on for help when faced with challenges in my academic life. My group was made up of hard-working people, and we all pulled our weight and contributed to the work and the discussions.' (Student, Poll question, Respondent 29)

'Cooperative learning is good because I believe that learners and teachers can learn from each other.' (Student, Question 8, Group 103)

'Even though we are all from different NWU campuses, we are still NWU students, and we could bond over that. I never felt as if I was speaking to someone from a different campus (sometimes I even forgot we were not all on the same campus).' (Student, Poll question, Respondent 48)

'My experience with my group was exceptional, the level of communication and understanding of each other was so good that to this point we still check up on each other, academic-related. They were so understanding and more like close family.' (Student, Poll question, Respondent 28)

'Very interesting, it was not what I expected. It really surpassed my expectations, and I thoroughly enjoyed my two days on the excursion. It was nice to actually experience the togetherness of all the students.' (Student, Question 1, Group 61)

'We were students from across South Africa, it was a great experience to meet new students, to share ideas, to see things from each other's perspectives. Like I previously said, I was blessed with an amazing group.' (Student, Poll question, Respondent 61)

In particular, one student referred to the value of receiving feedback from group members: '[Cooperative learning] is very rewarding. You develop skills and you get to meet new and interesting people. It is nice to have people who can give you valuable feedback'. (Student, Question 8, Group 9)

■ Theme: Issues and challenges with cooperative learning group dynamics

Although CL was predominantly positively perceived by most of the participants, there seem to be some groups who struggled to work effectively together because of a lack of cooperation amongst group members.

One of the major issues seems to be a lack in good communication skills and that they are not proficient in English:

'I was not impressed with my group, as they were very quiet, I had to share most of the time.' (Student, Poll question, Respondent 18)

'I did not have a good experience with my group at all. Only 2 of our group members were actively present (that includes me) and one other student was muted the entire time and did not participate or contribute any ideas. When the other group members joined our WhatsApp group, they did not communicate much (or at all) to research, further discussions, or to the compiling of the poster.' (Student, Poll question, Respondent 26)

'It was difficult because of the language barrier.' (Student, Poll question, Respondent 38)

'Getting to know the group members because some were having problems of network and some were using their home language to communicate.' (Question 6: Respondent 9)

Another major issue with CL was the lack of cooperation amongst group members. This might also be attributed to a lack of good communication skills or experience of English as a barrier; however, positive interdependence and individual accountability might also not have been structured strongly enough. In this context, the following participant responses were relevant:

'[…] not all participants will put in the same amount of effort.' (Student, Question 8, Group 45)

'It [*cooperative learning*] is complicated because some students are not cooperative.' (Student, Question 8, Group 49)

'It [*cooperative learning*] was not that great as expected, it felt like individual work and worrying.' (Student, Poll question, Respondent 8)

'Some students rely on others.' (Student, Poll question, Respondent 46)

In this regard, participants also acknowledged the fact that they lack effective social and small-group skills:

'[*Cooperative learning*] is difficult, as stated earlier, I am not good at group work.' (Student, Question 8, Group 20)

There were quite a number of students who experienced connectivity or network problems, which also played negatively on the overall CL experience. This finding is evident in the following remarks from the students from the open-ended questions:

'We didn't have a problem in working in the small groups in the Zoom sessions. We only had to wait a few minutes for some students, and other students had bad

connectivity problems so we couldn't always hear them. We actually worked great together.' (Student, Question 6: Respondent 22)

'It [*CL*] was challenging due to network but when I did connect it was exciting.' (Student, Question 1, Respondent 65)

'The network was bad, and I had to keep on rejoining the excursion of which became a challenge as I would find that I've missed information that was shared while I was struggling with network, but because I had a great group member, he explained everything to me, that's how I overcame the problem.' (Student, Question 4, Respondent 60)

'I didn't find any problems during the excursion. I just never received my data as promised.' (Student, Question 4, Respondent 51)

■ Discussion

Based on the data, as discussed in the findings of this chapter, the general assumption can be made that the students experienced the virtual excursion as predominantly positive, although not without some challenges. The Word Cloud (Figure 8.2) clearly indicates that the student-teachers experienced CL as a highlight.

The findings will now be further elucidated using CHAT as analytical heuristic. The different elements of an activity system, also referred to as the nodes, are not static or isolated, but are dynamic, forming constant interrelations with each other and can therefore be regarded as a unit with the purpose to enhance the object (Hasan & Kazlauskas 2014). The interrelations between the nodes can be of such nature to enhance the object (referred to as a positive relation) or there can be contradictions between the nodes that work negatively on the object (referred to as the *tensions* in this chapter). Some of the positive relations and tensions are highlighted in the successive discussion. The use of colour in Figure 8.3 only indicated the different positive relation or tensions and have no other significance.

In the findings described above, there several synergies between the nodes of the activity system to optimise the object. In this activity, the object is the interaction of students in a CL setting. We argue that the activity (students participating in activities during the excursion in a CL environment) was scaffolded so that the different nodes reinforced each other to enhance the object.

In the first finding (see section 'Theme: Enhanced learning'), students perceived their involvement in CL groups as beneficial towards their learning. The structured, positive interdependence within the CL groups allowed students to share ideas and therefore provided a platform for students to learn from each other and the facilitators. The fact that the students had the perception that their learning was enhanced through CL as a strategy (*tools*) can be attributed to a positive relation between the *community* and *rules* in

the activity system. The way in which positive interdependence (*rules*) was scaffolded during the activity created a positive environment for the group members (*community*) to effectively interact with each other whilst working on the problem, resulting in enhanced learning. The left-most horizontal arrow in Figure 8.3 represents this positive relation in the activity system.

Two other findings (see sections 'Theme: Enhanced social competency' and 'Theme: Sense of belonging') were that the excursion enhanced social competency and a sense of belonging. Smaller groups within a CL setting (*tools*), as was the case in the excursion, can contribute to the development of 'soft' social skills. This was also evident in this activity system, where it played out as a positive relation between the group members (*community*)

FIGURE 8.2: Word Cloud indicates that student-teachers experienced cooperative learning as a highlight.

Key: CL, cooperative learning.

FIGURE 8.3: Activity system of the 1st-year BEd students during the virtual excursion depicting the positive relations and tensions.

learning from each other because they respected each other as equals despite their social differences coming from the three campuses (*division of labour*). Developing these soft skills and contributing to their social competency may have had a lasting effect where they made new friends and plans to work together in the future, which contributed to the development of a common identity as NWU students. The right-most diagonal arrow in Figure 8.3 represents this positive relation between the *tools, division of labour* and the *community*, resulting in enhanced social competency and a sense of belonging.

The students also gave an indication that the CL groups contributed to the development of skills necessary for their future teaching careers (see section 'Theme: Influence on a future teaching career'). We argue that the way in which the different elements of CL were scaffolded (*rules*) assisted them to make the most of the CL experience (*objective*). This positive relation is represented by an arrow in Figure 8.3.

The last finding (see section 'Theme: Issues/challenges with cooperative learning group dynamics') deals with some of the challenges that

student-teachers experienced as barriers while effectively engaging in the CL environment. These findings were also analysed using CHAT as a heuristic.

Working in groups also causes some discomfort 'out of their comfort zone' with regards to communication (and not fluent in a particular language), but the safe and supportive environment within the groups provides opportunities to grow their communication skills. This can be regarded as a tension between *tools* (the use of language) and the *objective* (to interact and learn in a CL setting).

The authors claim that a lack of cooperation amongst group members might as well be attributed to positive interdependence and individual accountability that can still be structured stronger and can therefore be regarded as a tension between the *rules* and the *object*.

Zoom was used as the e-learning platform for the virtual excursion. Many students experienced the available data and network connectivity (*tools*) as a challenge preventing them from optimally gaining from the CL experience (*objective*). This tension between the *tools* and the *objective* is also represented by an arrow in Figure 8.3.

▆ Recommendations

The predominantly positive experiences of the students of learning in a CL environment can be indicative of the way in which the principles of CL were scaffolded during the virtual excursion. There were, however, also aspects of the excursion that the students experienced as challenging (tensions within the activity system). We therefore make the following recommendations that may contribute to present an even more successful excursion in the future:

1. Social skills development can be promoted through explicitly reminding students at the beginning of each activity that the group roles should be rotated within the groups. This will enable the students to be exposed to various aspects of the communication within the CL groups. Another way might be to include a checklist for social skills (Lubbe 2015) in the assessment component of the excursion (cf. ch. 10). In this way, students will be made well aware of the various social skills involved in such activities and possibly promote the development thereof.
2. It is a reality within the South African context that the students come from various socio-economic circumstances. This is also true for the students of the NWU, and we believe for most other universities in the country. In order to limit the network challenges, students from lower socio-economic circumstances and areas where the connection is weak can make use of study centres. The NWU has many ODL centres across the country that can also be used for this purpose.

3. The inclusion of an online team-building activity and group contracts might aid in stronger positive interdependence within the CL groups. The inclusion of group contracts might also encourage stronger individual accountability (Johnson et al. 2013). Having groups establish a group name and/or motto might also assist in structuring positive identity interdependence within the CL groups (Johnson & Johnson 2013; Lubbe 2015). An online team-building activity could, in conjunction with established positive identity interdependence, create a safe environment for group members to share their ideas (cf. Lubbe 2015).

4. The assigning of students to their respective CL groups might be better facilitated by ensuring that all groups are as heterogeneous in nature as possible (cf. Johnson & Johnson 2013).

5. In terms of the online nature of the virtual excursion, as well as the administrative aspects within the groups (including the roles and assessment), the use of an appropriate online platform could be beneficial. In this context, a website could be developed which will assist the students with all the logistical aspects of the excursion, including registration, group allocation, informed consent documentation, online resources, assessment, etc.).

■ Limitations

From this research, generalisations cannot be made for wider populations regarding the findings in terms of virtual excursions, as the population covered students from a specific faculty and at a specific institution. However, the findings may inform the wider scholarship of virtual excursions by means of CL groups. Another issue in terms of the research was the low number of participants who provided informed consent. Within this context, it might be necessary to revisit the procedure of obtaining informed consent from participants at the onset of the virtual excursion.

■ Conclusion

The excursion was scaffolded on CL principles and this chapter reported on how the first-year students experienced CL during virtual excursions. The findings clearly show that most students experienced CL as overwhelmingly positive. Although not the focus of this chapter, it is noteworthy that Chapter 5 shows that the excursion yielded statistically significant data with the Cheng et al. (2010) questionnaire. Despite the overwhelmingly positive results, the results also provide a clearer roadmap of how a virtual excursion should be conceptualised in order to enable greater positive interdependence and individual accountability.

■ Acknowledgements

Chapter 9

Gamification and addressing social justice and inclusivity through the 'Famine and Abundance' game

Byron J. Bunt
Research Unit Self-Directed Learning,
Faculty of Education, North-West University,
Vanderbijlpark, South Africa

Josef de Beer
Research Unit Self-Directed Learning,
Faculty of Education, North-West University,
Potchefstroom, South Africa

Neal Petersen
Research Unit Self-Directed Learning,
Faculty of Education, North-West University,
Potchefstroom, South Africa

■ Abstract

Gamification is a design technique that employs gameful design in a variety of situations, to create game-like interactions to promote various tasks and behaviours. Gamification has received a great deal of attention recently,

particularly in the education field. The practice of gamification of education and learning is growing, thanks to technological developments that enable more digitised learning settings as well as the utilisation of capabilities created in connection with video games to generate engaging and compelling learning experiences. The benefits of its use include aiding cognitive and even physical development, increasing levels of engagement and accessibility, as well as SDL. Over the past few years, education students have engaged in the 'Famine and Abundance' game during face-to-face excursions. The focus of this activity, where students, as *Homo ludens* [the playing human], explore aspects of social justice and inclusion, holds affordances as a fertile learning space to address personal biases and preconceived ideas (Sebotsa, Petersen & Vaughn 2020). It thus sets the stage for students to identify personal learning goals for themselves as self-directed learners, in their quest to become truly inclusive 'super-teachers'. In 2021, the game has been modified as an online activity, utilising gamification, and this chapter shares findings on students' experiences of engaging in the digital 'Famine and Abundance' game.

■ Introduction

One specific objective of behavioural scientists in assisting individuals to achieve better results is to create programmes that connect with people in activities that enhance their probability of completion (Huang & Soman 2013:12). In the domain of 'nudging', interventions assume the shape of minor adjustments in a context that can have huge consequences. Furthermore, the benefits of nudging may frequently be supplemented with longer-lasting interventions – actions that promote long-term commitment to a task at hand. In this chapter, we will concentrate on one such set of activities termed gamification.

Engagement and motivation are typically seen as requirements for task completion or the promotion of a certain behaviour. Dropouts or poor performance in school can be caused by tedium or a loss of interest, a growing trend of truancy in which each absence causes the individual to become less eager to return to school, and, most crucially, becoming distracted by technology such as cell phones and the Internet (Huang & Soman 2013:12). Teacher training programmes encounter comparable difficulties owing to a lack of enthusiasm and attentiveness. This scenario is frequently exacerbated by understanding difficulties and group hostility, which cause stress and dissatisfaction and, as a result, impair knowledge retention and the efficacy of teacher training programmes (Richtel 2010:1–11).

Gamification has become a common strategy in today's digital society for encouraging certain behaviours and increasing motivation and engagement. Although it is frequently used in marketing tactics, it is increasingly being used in many educational programmes as well, assisting teachers in finding a balance between accomplishing their goals and adapting to changing student requirements (Huang & Soman 2013:12).

The goal of this chapter is to describe gamification, dissect the procedure of gamifying as an excursion activity for student-teachers, investigate constraints and evaluate the successful implementation of the 'Famine and Abundance' game as a vehicle to address issues of social justice and inclusivity. In many areas of social justice and inclusiveness (e.g. financial literacy, health education, consumer learning and disclosures), we view education efforts as a suitable partner to nudging programmes and therefore a major issue for policymakers and people on the ground implementing these programmes (Huang & Soman 2013:12). Nevertheless, educational gamification is fruitful and may be readily expanded to other areas where interventions are needed to improve engagement and retention.

■ Problem statement

South Africa has 11 official languages, the majority of which are spoken by diverse students at the country's universities. As a result, universities are required to accept diverse students in accordance with the *Higher Education Act No. 101 of 1997*, which states that there shall be no prejudice in admitting students to tertiary institutions as long as they fulfil the entrance criteria (Sedibe 2011:171–176). As a result, ethnic variety in an educational environment should be embraced. Education is a constitutional right, not a luxury, as everywhere in the globe. In the case of South Africa, as stated in the *Constitution of South Africa Act No. 35 of 1997*, the following principles are explicitly stated: human dignity, equality, development of human rights and freedom, nonracialism, and nonsexism. Yet they are repeatedly violated in everyday life, and sadly, in the classroom (Moyo & Hadebe 2018:1–17).

There is no law anywhere in the world that encourages racism, bigotry, sexism, or any other kind of intolerance. Apart from that, the National Plan for Higher Education 2004 was passed by Parliament and resulted in the merging of HEIs in South Africa (Sedibe 2011:171–176). As a result, institutions with a majority of white students amalgamated with institutions with a majority of black students (cf. ch. 2 for a comprehensive discussion of NWU merger). Within the South African setting, an HEI is a university or college (Moyo & Hadebe 2018:1–17). This Act has a significant impact on the diversity of South African universities' student bodies. Thus, a varied student population is brought to the forefront as an urgent and complicated problem, and research projects are underway to address it. For this reason, it is critical to instil a culture of tolerance and openness amongst students so that they can coexist peacefully, particularly with the help of gamification (Moyo & Hadebe 2018:1–17).

Numerous educators (Avalos 2011; Geoff 2009; Sarason 2011) have noted:

[7]hat human development, particularly socio-economic growth, is dependent on access to quality education, the effectiveness and sustainability of its basic education system, the skills and knowledge developed within that particular education system. (pp. 10–20)

To that list may be added the type of teachers found within that specific education system (cf. Ojose 2011; Silva et al. 2006; Tella 2008). A growing number of developing nations, such as South Africa, have realised the need of investing in knowledge-based, high-tech global trend advancements in order to accomplish equitable educational objectives in the fast-paced digital age. The present system must be changed, but disagreements persist on how to do so successfully in reality because of a variety of educational impediments (Adler & Reed 2002; Moon 2014). According to Moyo and Hadebe (2018:1), challenges 'include a lack of funds, politicisation of education access, buildings and equipment, instructional materials, and libraries that lack electricity or computers'.

The majority of South African teachers, however, fail to recognise variations in students' learning characteristics, choose suitable teaching techniques, and combine and integrate current creative pedagogies (Ericsson 1993; Feuerstein 1980; Geoff 2009; ed. Schultz 2013; Smith 2002). With these difficulties in the classroom, educators in postcolonial Africa must re-evaluate the role of education in preparing learners for a creative and digital future. Others may wonder if creative, techno-oriented, hands-on learner pedagogies can be used by most South African teachers, as opposed to the chalk-talk methods that are being used today, when critical literacy is required for problem-solving, decision-making, goal-setting, and lifelong learning (Moyo & Hadebe 2018:1–17). As a result, South African educational institutions create students who appreciate technology rather than those who can develop it and actively participate in the information age (Moyo & Hadebe 2018:1–17).

Students will need to be taught thinking and reasoning skills rather than just what to think, as has been the case in the past (Bransford & Darling-Hammond 2005; Kincheloe 2008). This kind of instruction will need a change in the way teachers are trained (Petty 2006). For this reason, South Africa today requires an education system that can create students who can develop appropriate answers to pressing global issues, as well as students who can keep their sanity in the face of rapid technological change and disruption. This is today's innovative educational challenge in Africa (Moyo & Hadebe 2018:1–17).

If most South African teachers are unable to meet current and future learning needs, it can be traced back to the educational experiences they had whilst in primary and secondary school, as well as how they were trained in universities, which were dominated by transmission teaching and thus lacked learner activities and innovation foundations (Moyo & Hadebe 2018:1–17). A multidisciplinary curriculum for the 21st century differs from conventional chalk-talk pedagogies in that it is project-based, research-driven, and includes higher-order thinking abilities, multiple intelligences, technology, and multimedia (Guskey 2002; Lawton 1987; McAninch 1991).

South African schools now face the difficulty of providing lessons that include inclusive and varied teaching and learning activities appropriate for the 21st century (Moyo & Hadebe 2018:1–17). According to Huang and Soman

(2013:12), several teachers, both new and experienced, have believed that all students learn in the same way, by listening to lectures, doing homework, and paying attention to what the teacher says. As a result, students who are not inquisitive or analytical are more productive. Teachers in South Africa need to be better prepared, and those who are already in the profession need to have their abilities refined (Moyo & Hadebe 2018:1–17). Teachers with inadequate training are less creative in the classroom and less able to analyse the current digital era's learning requirements. Poor teacher training impacts both (Huang & Soman 2013:13). Many instructors in the digital age are unable to use a broad variety of active learning methods, techniques and strategies, digital teaching aids, and materials because of inadequate training (Geoff 2009; ed. Makoelle 2016; Nkabinde 1997). Because prescribed textbooks and traditional media (such as charts, wordcards, and still pictures) do not support and cater to inclusive pedagogy, teachers' beliefs and attitudes about deliberately promoting technological literacy for students with differing learning styles, intellectual capacities, or needs are heavily relied upon (Moyo & Hadebe 2018:1–17).

In light of the aforementioned issues with teacher preparation and classroom management, a paradigm change in educational thinking is required. It is important to remember that a paradigm shift and curricular change need extensive and thoughtful discussions, careful preparation, and most of all, a systematic approach to how to finance the changes that are required and what has to be altered (ed. Makoelle 2016). Curriculum reform is being pushed by the idea that education should be technologically focused and open to everyone (Moyo & Hadebe 2018:1–17). It also means that education systems prepare sufficient supplies of human resources who are competent and recognise their role in bringing into reality the current global educational vision, which has a wide connotation of education being seen as technology-oriented (Huang & Soman 2013:12).

■ Theoretical framework: Social constructivism

Human learning and development are mediated by culture, according to Russian psychologists Lev Vygotsky and his colleagues, neuropsychologist Alexander Luria and developmental psychologist Alexei Leontiev. Their previous terms were cultural-historical psychology and instrumental psychology, respectively (Roth & Lee 2007:186–232). Wilhelm Wundt, generally regarded as the father of modern empirical psychology, was a German philosopher and psychologist who worked in the late 1800s. Mental and physical functions should be studied in connection to each other, as well as the higher psychological functions resulting from people's interactions in the social world such as thinking, language, imagination, and conventions. The intellectual environment should also be studied (Cole 1996). Wundt established experimental psychology as a field of study and was a forerunner in cultural psychology.

Psychological functions at both the basic and higher levels were studied by Vygotsky (1978). Vygotsky put the social environment at the heart of human learning and development by placing culture in the midst of humans and context (Roth & Lee 2007:186–232). Human learning and development are mediated by culture according to Vygotsky's experiments: cultural artifacts are created and used by people as active agents (tools and symbols) to direct their actions and ideas and to free themselves from the constraints of their environment (Cole 1996; Roth & Lee 2007:186–232). The 'Famine and Abundance' game is embedded in social constructivism: students first explore social justice issues in a social setting, and then they internalise it and reflect upon it.

From social constructivism, emerged the development of CHAT as a research lens. As a result of Vygotsky's work, CHAT split into two distinct schools: the Soviet and Eastern European and the North American and Finnish schools (Wilson 2014:20–29). As early as the 1970s, researchers in the United States and Western Europe, such as Michael Cole, Yrjö Engeström, and Frederick Erickson have made significant contributions, as have others such as Dorothy Holland and Alex Kozulin (Wilson 2014:20–29). The modern North American and Finnish branch also includes Jean Lave and Ray McDermott, as well as Annalisa Sannino and Silvia Scribner. Educators such as John Dewey, G. H. Mead, and Gregory Bateson, as well as psychologists and anthropologists from the United States, contributed to this branch of education theory, which was inspired by the philosophical school known as pragmatism or American pragmatism (Wilson 2014:20–29).

In terms of CHAT, there are three key factors to recognise:

1. Mediation's importance cannot be overstated. A new type of behaviour emerged throughout phylogeny with the modification of material things by humans as a method of controlling their interactions with one another and the environment (Wilson 2014:20–29).
2. Genetic (historical analysis). According to Vygotsky's (1978) use of Pavel Blonsky's words, 'to understand behaviour, one must comprehend the history of behaviour'. There were many temporal scales where this injunction was used: species history (phylogeny), social group history (culture), individual history (ontogeny), and moment-to-moment interactions that make up live behaviours.
3. Grounding in a group activity with a strong cultural component. Everyday human actions serve as a cultural-historical natural laboratory for examining how culture affects human development (Wilson 2014:20–29).

There are many uses for CHAT today, including neurological assessment and early childhood education as well as organisation studies and human–robot interaction. It is also being used in teacher education and systemic change, as is the focus of this chapter. It is also being used in industrial engineering, communication science, and agriculture in the United States as well as internationally (Engeström 2016; Roth & Lee 2007; Sannino, Daniels & Gutiérrez 2009).

As a result of the work of Cole and Engeström, the third generation of CHAT was created (Cole & Engeström 1993; Engeström 1987) and began to catch the eye of education researchers. Since then, the scope of its use has grown significantly. The application of CHAT theory in education has grown during the 1990s, although it is still underused in general and especially in special education (Artiles 2011; Roth & Lee 2007).

Engeström (1999) presents the complex interactions of an activity system. The various components of an activity system are identified by specific terms, which are applied in research analyses based on CHAT (see Figure 9.1). These will now be briefly discussed, within the context of a specific example.

The subject of an activity system is the individual or group of individuals whose point of view is the focus of the analysis, such as a teacher or a group of students. The aim or motivation of the activity system as a whole (rather than that of individual members), for example, increasing student outcomes, is the object (Wilson 2014:20–29).

The nature of the society to which the activity system belongs, the norms of normal behaviour suitable to the system, and the distribution of labour within the system all have an impact on both subject and object. The phrase division of labour refers to the Marxist study of social relations and may apply to both authoritarian power structures within the system and the manner in which labour is divided within the system (Wilson 2014; Tsui & Law 2007:1291):

> In other words, rules and the division of labour define how participants are expected to behave and who is expected to do what in the achievement of the object of an activity system. (pp. 20–29)
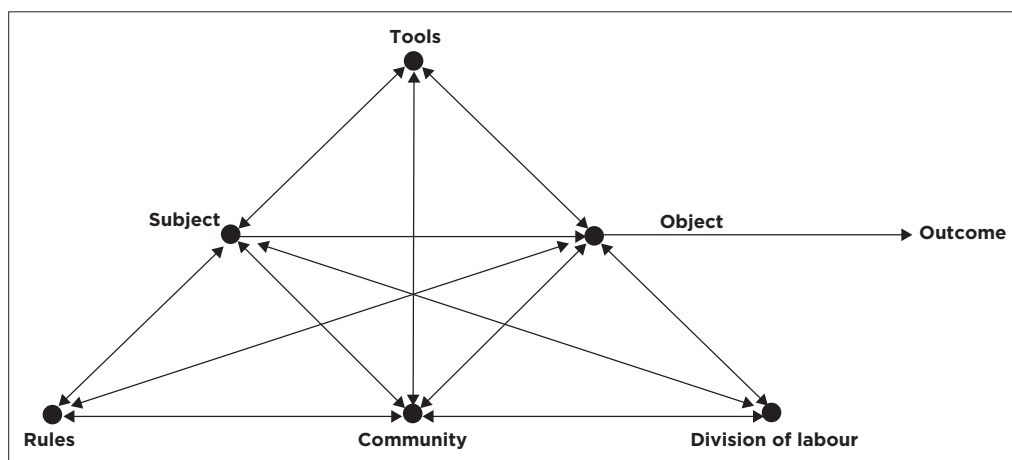
Source: Adapted from De Beer and Mentz (2017:11); Engeström (1987).
Note: 'Subject' refers to the main participant in the activity system (AS); 'object' to the major goal of the AS; 'tools' refer to the resources and pedagogies at play during the activity system; 'rules' refer to legislation and factors that influence the activity system; 'community' includes all the stakeholders in the AS; and 'division of labour' refers to the different roles of the subject in the AS.

FIGURE 9.1: The components of an activity system.

For example, a class teacher (subject) who wants to enhance students' success (object) at a certain school (community) may seek to implement a new learning method (tool) (Wilson 2014:20–29).

Based on the school's organisational hierarchy (division of labour), the teacher may be restricted because the new concept is viewed as straying from implicit norms (rules) or welcomed if the school's mindset is to promote innovation – also an underlying rule (Wilson 2014:20–29).

A system's components may shift around over time because activity systems are dynamic. For this reason, if a novel learning approach succeeds, it may be accepted by other educators and implemented as a standard practice at the school (Wilson 2014:20–29).

An activity system's interactions with other systems, whether inside or outside of it, may lead to new learning and growth. Educators believe that the continuous movement and change inside systems serves as a catalyst for 'expansive learning' (Engeström 1999). Activity systems and adjacent clusters of activity systems may be analysed for 'contradictions', which can be a source of learning (Avis 2009).

Contradictory views may emerge in connection to the object of an activity system, leading to various perceptions of the system's other elements (such as tools or artefacts, rules, and so on) (Wilson 2014:20–29):

> One of the insights that a CHAT perspective affords is the analysis of multiple motives working on the same object and distinguishing a diversity of motives amongst those (collectively) in the subject position. (Ellis et al. 2011:18)

Participants become more critical of the situation as contradictions and alterations inside the activity system become more disruptive and difficult. As a result, they start looking for alternative solutions (Wilson 2014:20–29). Through this process of transformation, current assumptions and conventions may be questioned and altered. There are exceptions to this rule, and conflicts within activity systems may endure if they are not completely recognised (Wilson 2014:20–29). Researchers may detect these inconsistencies and propose opportunities for expanded learning by using the CHAT framework for analysis. Examples of this kind of analysis may be found in Edwards and Protheroe's (2004) research and the work of Ellis et al. (2011).

■ Conceptual framework

■ Gamification

Since its introduction in the early 2010s, gamification has been a trending topic in business and academia, using the design approach of applying gameful design in many settings to induce experiences known from games to promote diverse activities and behaviours. Particularly in educational settings, the use

of gaming has acquired considerable traction (Koivisto & Hamari 2019; Seaborn & Fels 2014). Using games to enhance education and training has a long history that is easy to comprehend, because game design and learning theories are strongly influenced by the same psychological underlying principles (see, e.g. Deterding 2014; Landers 2014). A growing trend in education and learning has been to gamify it via the use of new technologies such as those created in connection to video games to provide students with more immersive and engaging learning experiences (Majuri, Koivisto & Hamari 2018):

1. Improved user satisfaction: Continuous recording of one's own behaviour visualises progress, promotes the development of attainable personal objectives, and provides instant feedback, causing users to experience emotions of great individual performance (Blohm & Leimeister 2013).
2. Conveyance of optimism: Gamification allows for self-determination as well as a feeling of accomplishment, or more precisely, the prospect of success (Blohm & Leimeister 2013).
3. Facilitation of social interaction: Gamification is often associated with joining a community of peers, allowing for social exchange and/or competitiveness (Blohm & Leimeister 2013).
4. Meaning: Gamification often enables people to engage in addressing superordinate issues beyond one's own capabilities. These processes promote feelings of control, autonomy, and enjoyment, all of which are important precursors to flow experiences (Zichermann & Cunningham 2011).

Flow improves both productivity and commitment by reinforcing voluntary usage of gamified strategies in the classroom. It is possible to systematically stimulate internal motivations and flow by providing extrinsic rewards (Blohm & Leimeister 2013). As a result, rewards like badges satisfy both the intrinsic and extrinsic motives of collecting and earning social recognition. Thus, gamification makes it possible to create compelling incentive systems that go well beyond monetary rewards (Zichermann & Cunningham 2011).

Because of this, gamification has a great deal of promise for altering patterns of behaviour and aiding learning processes:

1. Gamification links behavioural change to positive emotional feedback, which in turn motivates people to adopt new behaviours. Using gamification in this way, new patterns of behaviour may be introduced, as well as old habits being modified (Ortega Sánchez & Gómez Trigueros 2019). Because of these unconscious and automatised patterns of behaviour, conventional incentive schemes are seldom successful. Gamification, by delivering pleasant emotions, may disrupt current habits, replace them with new ones, and help stabilise the new ones by constantly presenting stimuli that are suitable (Zichermann & Cunningham 2011).
2. To assist learning, gamification divides a project into smaller, more manageable chunks. Using trial-and-error methods, users may work their

way up to a certain skill level by completing these subtasks over and over again until they have mastered the issue (Blohm & Leimeister 2013). There may be a systematic way to build cognitive structures for the internalisation of learning materials via the creation of increasingly demanding activities.

According to Figure 9.2, when it comes to categorising previously established gamification components, Toda et al. (2019:1–14) suggest utilising five categories. At least five experts looked at each piece to determine which dimension it should be placed in. For example, when specialists examined the Point element, they discovered that it was an external feedback component, which is provided when the learner performs a certain activity

Source: Toda et al. (2019:1–14).
FIGURE 9.2: Gamification taxonomy.

in the environment. Because it serves as a kind of feedback to the learner, it belongs in the Performance/measurement category. The following is a breakdown of the measurements (Toda et al. 2019:1–14) (Figure 9.2).

■ Performance and measurement dimension

These are environmental response components that may be utilised to provide the learner feedback. We have Point, Progression, Level, Stats and Acknowledgement in this dimension. Students may get confused if this component is missing from the learning experience (Toda et al. 2019:1–14):

- **Acknowledgement:** Badges, medals, prizes, and recognition are all terms used to describe acknowledgement (Toda et al. 2019:1–14). A 'Solver' badge may be awarded for solving a specific number of problems; the completion of a task within a predetermined time limit may result in the award of a 'Flash' trophy; the completion of a task that requires engagement with other students may result in the award of a 'Socialiser' achievement; and the completion of a task that requires contributions may result in the award of a 'Contributor' badge. In gamified apps, acknowledgement is a common feature (Klock et al. 2018; Koivisto & Hamari 2019; Toda, Valle & Isotani 2018).
- **Level:** Level is also referred to as skill level, character level, and so on. This is linked to an extrinsic hierarchy structure that offers the user additional benefits as they progress in the environment; for example, students earn a level when they accomplish a specific number of activities, and as they improve their level, they have accessibility to more difficult tasks (Toda et al. 2019:1–14).
- **Progression:** Progression is sometimes referred to as progress bars, steps, and maps. External direction is provided to users of their advancement in the environment, enabling these users to find themselves (Toda et al. 2019:1–14).
- **Points:** Points are sometimes referred to as skill points, experience points, scores, and so on. It is a straightforward method of providing extrinsic feedback to users' activities. The most fundamental idea present in nearly all gamified apps is the point (Dichev & Dicheva 2017).
- **Stats:** Stats are often referred to as data, heads-up display, and information. They are linked to the visual data supplied to the learner by the environment (extrinsic), such as how many tasks they performed or general statistics on the environment. Dashboards may also be used in virtual environments (Toda et al. 2019:1–14).

■ Ecological dimension

This context is linked to the setting in which the gamification is being applied. These elements may be expressed as attributes. This dimension contains the

components of Imposed Choice, Chance, Rarity, Economy, and Time pressure. The absence of ecological components dulls the environment because it lacks aspects that create engagements with the user (Toda et al. 2019:1–14):

- **Chance:** Chance is sometimes referred to as randomness, luck, fate, or probability. This intrinsic concept is related to the random property of a specific event or outcome; for example, the student may receive a random number of points after finishing a task; rotating a roulette wheel may provide the user with a bonus; the user has a chance of receiving a key item predicated on its luck (Dignan 2011).
- **Imposed choice:** Imposed choice is sometimes referred to as choice, judgement, and pathways. This extrinsic notion arises when the player is presented with an explicit choice that they must select in order to progress in the environment. One example of this idea is to provide the user with two distinct contents and force them to select one or the other, preventing them from progressing if a decision is not made (Toda et al. 2019:1–14).
- **Economy:** Transactions, market, and exchange are all terms used to describe the economy. This notion is intrinsically linked to every transaction that may take place in the environment. Examples include exchanging points for benefits in the surroundings and in relation to the content (Toda et al. 2019:1–14).
- **Rarity:** Rarity is sometimes referred to as limited goods, collecting, and exclusivity. It is linked to externally restricted resources inside the environment that may motivate learners to achieve a particular goal (Toda et al. 2019:1–14).
- **Time pressure:** Time pressure is also known as clocks or countdown timers. It is linked to the use of time to exert pressure on the learners' activities (extrinsic). This may also be expressed as deadlines in learning settings. It is regarded as one of the most irrelevant factors, along with Social Pressure, because it has the ability to disconnect the learner (Toda et al. 2019).

■ Social dimension

This aspect has to do with how students connect with one another in the classroom. Competition, cooperation, reputation, and social pressure are all aspects of this dimension. As a result of the absence of social aspects, students may become isolated from one another (Toda et al. 2019:1–14):

- **Competition:** Competition is also referred to as leader boards, conflict, scoreboards, player vs. player, and so on. It is an inherent idea, linked to a challenge in which the user competes against another user to accomplish a shared objective, such as utilising scoreboards depending on the number of levels, points, badges, and so on (Shi et al. 2014).

- **Cooperation:** Cooperation is sometimes referred to as groups, teamwork, co-op, and so on. It is also an intrinsic notion (connected to a task) in which users must cooperate to accomplish a shared objective, which may be thought of as the inverse of competition (however, both concepts can be used together). Tasks where groups engage with one other and are recognised by these interactions are examples of cooperation (Shi et al. 2014).
- **Reputation:** Reputation is often referred to as categorisation and standing. It is associated with titles that the learner might acquire and collect inside the environment (intrinsic). Titles, as opposed to levels, indicate a social standing that does not always correspond with the learners' abilities. These titles are often used within groups to establish a hierarchy (Shi et al. 2014).
- **Social pressure:** Peer pressure and guild missions are examples of social pressure. This intrinsic notion is linked to social situations that put the learner under strain (Shi et al. 2014).

◼ Personal dimension

This dimension is associated with the learner who is interacting with the environment. Puzzle, Objective, Sensation, Novelty, and Renovation are the components utilised in this dimension. Because the system does not offer significance for the learner, the absence of Personal aspects may cause a person to feel demotivated (Toda et al. 2019:1–14):

- **Novelty:** Novelty is also referred to as a surprise, update, changes, and so on. It is inextricably linked to the changes that take place inside the environment, such as the addition of new information, material, or even game components. It is a smart strategy to retain people inside the environment in order to prevent stagnating, because longitudinal research on gamification has shown that a static approach (without changes) may induce disengagement and demoralisation (Hanus & Fox 2014).
- **Objectives:** Objectives are sometimes referred to as objectives, side quests, milestones, and so on. This intrinsic notion is linked to objectives; it gives the player an ultimate goal or a reason to complete the necessary activities. Examples of how to utilise Objective may be broad (such as being accepted into a course) or particular (such as achieving a certain score on an assignment) (Toda et al. 2018).
- **Puzzles:** Puzzles are also characterised as challenges, cognitive activities, physical puzzles, and so on. This intrinsic notion is associated with the tasks that are performed within the environment; they may be linked or regarded as learning activities because the goal is to offer a cognitive challenge to the student. This idea is also present implicitly in all educational settings, such as quizzes or challenges (Hanus & Fox 2014).

- **Renovation:** Renovation is also called 'boosts', 'extra life', 'renewal', and so on. This notion is inextricably linked to the characteristic of redoing an activity, event, or anything else. It gives the student a second opportunity after failing a task. It is one of the characteristics that contribute to the enjoyment of gaming (Lee & Hammer 2011).
- **Sensation:** These may be either visual or auditory stimuli, for example. Sensation is associated with the use of learners' perceptions to enhance the learning process (intrinsic). This may be accomplished via interactive and dynamic interfaces, virtual reality (VR), and/or AR (Hanus & Fox 2014).

◼ Fictional dimension

It is the combined dimension that connects users (through Narrative) and the setting (by Storytelling), connecting their experiences to the environment. The absence of fictional components results in decreased sense of meaning and context, which is why, inside the interactive experience, the user must complete any activity, as well as having a direct impact on the quality of the user experience (Toda et al. 2019:1–14):

- **Narrative:** Narrative sometimes referred to as the karma system, implicit choices, and so on. This fundamental notion is the sequence of events as things occur in the game, as seen by the user. This experience is affected by the user's implicit decisions. Giving a little gift of gratitude to students who choose to engage with other students in a discreet and covert manner is one example of this (Palomino et al. 2019).
- **Storytelling:** Storytelling may be seen as audio queues, text narratives, and so forth. It is the manner in which the environmental narrative is conveyed (as a script). It is communicated via text, speech, or sensory resources. It is often utilised as a technique to reinforce a story inside a context (Palomino et al. 2019).

◼ The 'Famine and Abundance' game

The 'Famine and Abundance' game includes student-teachers getting (randomly) a passport of a nation, as well as money depending on the country's Human Development Index, which they may use to purchase food at the 'excursion store' (Petersen & De Beer 2019). As a consequence, students from developed nations are able to purchase anything they want, whereas students from poor countries are unable to buy anything. This exercise allows student-teachers to think on the country's huge socio-economic gap between the 'haves' and 'have-nots'. Students from privileged backgrounds have the chance to vividly observe and reflect on the lives of the impoverished. Following that, the debate focuses on the teacher's responsibility and how to cope with the socio-economic gap in the classroom (Petersen & De Beer 2019).

In the light of the global COVID-19 pandemic, the game was digitalised for an online learning environment. Students had to click on a link and type in biographical data, upon which they (randomly) received a passport for a country, as well as virtual money that they could use to buy food online (filling their virtual shopping baskets) – refer to Figure 9.3.[5]

Source: Developed by Josef de Beer, graphic design by the North-West University, published with permission by Josef de Beer and North-West University.

FIGURE 9.3: The 'Famine and Abundance' game: (a & d) citizens of a Scandinavian country such as Norway received large sums of money to purchase food; (b & e) in contrast, students who received passports of developing countries like Sierra Leone had far fewer choices during online shopping; (c & f) some of the food items available during online shopping: will it be a steak and chips ($60) or a slice of bread ($2)?

5. Readers can click on the link to 'Famine and Abundance' game (http://faa.structile.co.za). Instead of a student number, any numerical numbers can be typed in (e.g. 1 2 3 4). This was followed by small-group discussions in the break-away rooms followed by feedback in the plenary session.

■ Social justice and inclusivity through gamification

Social justice issues are unquestionably educationally relevant in teacher preparation programmes (Ortega Sánchez & Gómez Trigueros 2019). Because of this, students may develop a critical conscience, learn to see things from many perspectives, develop their personal and social identities in a pluralistic way, respect other people's identities, defend social justice, and resist exclusion or discrimination in any manner (Pagès 2005:45–55).

For citizen involvement to be effective, teachers must be trained in social reality knowledge, which necessitates the inclusion of important social problems or socially active topics in their curriculum. Including cooperative-collaborative work and planning in educational settings makes it easier to critically analyse material and come up with fresh queries (Ortega Sánchez & Gómez Trigueros 2019). These aspects of a game may provide situations, pedagogic alternatives, and sufficient resources for promoting social justice education and tackling gender inequality (Pagès 2005:45–55).

■ Context of work-integrated learning excursions

Amongst the principles upheld by the NWU are respect for all human life, equality for all people, freedom, tolerance, and respect for others. As a result of these principles, the university's teacher education curriculum is also influenced. The institution organises educational trips for all of its first-year (BEd) student-teachers in order to aid in the development of these principles. The programme's goal was to get students ready for the challenges they would face in future multicultural classrooms. Research backed up the programme's claim that cultivating these qualities in 'clinical' lectures is difficult (De Beer, Petersen & Dunbar-Krige 2011). There is a WIL component to this trip that emphasises 'learning from practice'. There will be an 'island situation' with individuals of different races, cultures, religious beliefs, and sexual orientations on the trip (Sebotsa et al. 2020:279–322).

Excursions like this have been shown to provide many advantages for student-teachers in the form of personal, social and professional development, as well as aiding students in mapping out their future career paths (De Beer et al. 2011). First-world nations like Finland, according to Nauman (2018), connect their educational system's performance with their 'dedication to equality'. The authors believe that without addressing problems of equality properly via educational programs, South Africa will never be globally competitive. The WIL trip serves as an excellent venue for sensitising prospective teachers on these concerns.

First-year student-teachers will benefit from the excursion programme by developing more sophisticated conceptions of the complexities of the teaching profession, as well as becoming inclusive practitioners who are sensitive to problems of equality and social justice in the classroom (Sebotsa et al. 2020:279–322). Excursions include sharing personal experiences, which were part of the plan to help our student-teachers learn important qualities like tolerance and respect. With the lessons and principles learned on the excursion, these students will be more prepared and equipped to cope with diversity when they enter classrooms as future teachers. We agree with Sebotsa et al. (2020:279–322) that these outings have advantages such as giving student-teachers a chance to reflect critically on problems of inclusiveness and their own prejudices against diversity. Sensitising future teachers to problems of diversity and inclusion throughout their four-year preparation may better equip them to cope with diverse classrooms in the 21st century's complicated challenges.

There was a focus on how to become a 'super-teacher' on the trip, as opposed to simply another teacher. Student-teachers were encouraged to think about how to become super-teachers and how to overcome problems of inclusiveness, diversity, and social justice in their classrooms and in society as a whole throughout all of the activities and discussions that took place with the guest speakers. Designing the teaching-learning activities and scaffolding them in such a manner as to promote the ideals envisioned by NWU was done using suitable and effective teaching-learning approaches, such as the 'Famine and Abundance' game (Sebotsa et al. 2020:279–322).

A variety of active teaching-learning approaches, or engaging pedagogies, were used to fully involve students, question their viewpoint on inclusiveness problems, promote contemplation on hot-button topics, and internalise them by improving their disposition towards the subject matter under discussion.

Cooperative learning, PBL, case-based studies, and dramatisation are a few of the interesting pedagogies used, as well as gamification. A pedagogy of play was advocated by the activities provided, as shown by the selected educational theories, such as the Huizingan concept of *Homo ludens* [the playing human] (Huizinga 1955), such as a simulated HIV and AIDS game and instances of dramatisation, as well as the 'Famine and Abundance' game. The students used 'dramatic collisions' (emotional discomfort) (Veresov 2010) in several of the exercises to push students beyond their comfort zones and get them to think about their affective domain. According to Veresov (2010), it is clear that:

> As a result of such emotionally charged encounters, the mind of the person may undergo dramatic transformations, and this could constitute some kind of mental

function growth act. […] Such mental shifts are difficult to achieve in the absence of internal conflict. (n.p.)

On page 88, the author writes, 'The second goal of the NWU excursion is to get students to experience "cognitive dissonance" (Festinger 1962:88)'. Discomfort in one's thinking may be a useful tool for increasing consciousness and acting as a stimulus for introspection. Student-teachers must be self-directed learners in order to deal with these concepts, such as 'dramatic collisions' and 'cognitive dissonance'. For example, a student teacher should rise to the challenge to be inclusive and comprehend the decision-making process (Veresov 2010). To be an inclusive teacher, the student teacher must establish learning objectives and identify human and material resources to help him or her be more inclusive throughout the program (Sebotsa et al. 2020:279–322).

■ Methodology

We draw on two data sets in this chapter. Although the primary focus is on the affordances of virtual excursions (data set 2), we do in the CHAT section compare these face-to-screen events to the face-to-face excursions of past years (2016–2019), which comprises data set 1. We also draw on our own experiences as both facilitators and researchers in this CHAT analysis. The face-to-face excursion data and findings have been extensively published (e.g. De Beer, Petersen & Van Vuuren 2020:chs. 5, 7, 9, 10); therefore, only brief reference will be made to the research methodology in terms of data set 1. The emphasis of this chapter is on data set 2, related to the gamification of the 'Famine and Abundance' game:

- **Data set 1: Face-to-face excursions (2016–2019):** A convergent quan-QUAL mixed method design (Creswell & Creswell 2018) was used in researching the face-to-face excursions that the NWU engaged with in the period 2016–2019 (De Beer et al. 2020).
- **Data set 2: Virtual online excursions (2021):** In order to gauge the emotional involvement of students during the game, they were asked (as part of the online opinion poll after the game) to describe how they felt after the game, by using one word. This is shown in Figure 9.4. In the open-ended questionnaire, students were also asked to provide feedback on (1) the 'Famine and Abundance' game particularly, and (2) what they experienced as highlights of the virtual excursion. Many students indicated that the 'Famine and Abundance' game was such a highlight. Based on students' feedback in the open-ended questionnaire, a number of themes emerging from the data are discussed in this chapter. Ethical aspects related to this research were discussed in detail in Chapter 2.
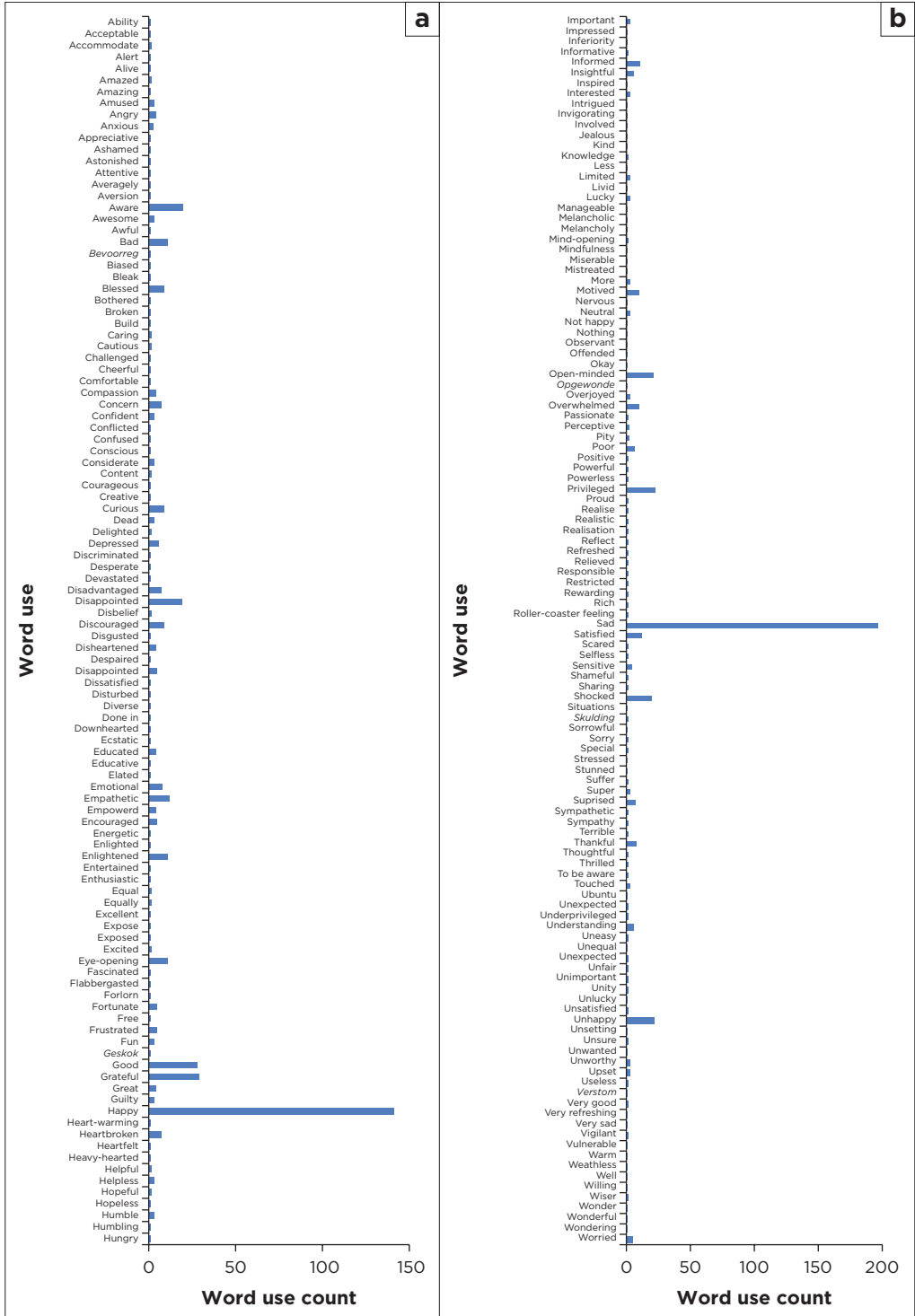
FIGURE 9.4: (a & b) Student-teachers' experiences of participating in the 'Famine and Abundance' game.

◼ Findings in terms of the virtual excursion (data set 2)

From the qualitative data, three themes emerged.

▢ Theme 1: The game evoked a range of emotions in students, and data show an emotional presence and immersion in the online platform

Cleveland-Innes and Campbell (2012) have shown that emotional presence is often a characteristic of the online learning space. One of the strongest themes emerging from the data is the emotional presence of students during the game. In Figure 9.4, a summary is provided of how students perceived the 'Famine and Abundance' game (they had to type in one word in a Google Form). The word used by most students (n = 197) was 'sad', whereas other emotive words like 'grateful' (n = 29), 'unhappy' (n = 22), 'shocked' (n = 20), and 'disappointed' (n = 19) featured strongly. Whether it was a positive or negative emotion probably resulted from the passport that the students received. The data showed that students immersed themselves in the virtual game.

It was interesting to see how students had taken up their new online persona in the 'Famine and Abundance' game. Milik (2017:74) explains 'persona' as a social front, and rather than being an avatar in the online environment, or a 'real' person in the 'real world', a persona is a construct that assists the person to create consistent communications with others during the game.

One student commented:

'I was a poor female citizen from Sierra Leone, and it was painful to see how my colleagues could buy all the food they wanted, and I could not afford anything'. (Student teacher, Excursion A, 17 August 2021, unknown gender or race).

Another student stated:

'I was fortunate to be a citizen of Norway, and I received a lot of money. My initial thought was to buy everything what came to hand but then I realised that I have enough resources in terms of money so that I can buy enough food to share with my other four group members. Sharing is caring. Better to give than to receive. That is what kind of a teacher I want to be.' (Student teacher, Excursion F, 02 September 2021, unknown gender or race)

In the open-ended questionnaire, students responded as such on the 'Famine and Abundance' game:

'The "Famine and Abundance" game really touched me, and as a teacher, you should be sympathetic to certain issues.' (Student teacher, Excursion H, 09 September 2021, unknown gender or race).

'This game was like a blow in the stomach, one tends to forget that there are many people out there who are less fortunate, and I was very emotional after the game.' (Student teacher, Excursion A, 17 August 2021, unknown gender or race)

☐ Theme 2: The 'Famine and Abundance' game opens a more international perspective for students, many of whom have not travelled abroad

A strong theme that also emerged was that the game created an awareness of inequality, poverty, and privilege, and made students aware of how South Africa is actually a world in one country:

'The "Famine and Abundance" game was a highlight, it was fun and it made me realise that we're not all from the same backgrounds.' (Student teacher, Excursion G, 07 September 2021, unknown gender or race)

'This excursion took off the blindfolds from my eyes, because some of the things that were discussed I never knew.' (Student teacher, Excursion G, 07 September 2021, unknown gender or race)

'I enjoyed the "Famine and Abundance" game, because I got a chance to learn about the state of other countries' economies.' (Student teacher, Excursion M, 28 September 2012, unknown gender or race)

'The online shopping was a highlight, because it taught me something that I was not aware of like the influence of countries' economy on the education system.' (Student teacher, Excursion E, 31 August 2021, unknown gender or race)

'I enjoyed the "Famine and Abundance" game. It was the most exciting part of the excursion. It allowed us to reflect on how the individuals of a particular country are affected by its socio-economic situations.' (Student teacher, Excursion B, 19 August 2021, unknown gender or race)

☐ Theme 3: The 'Famine and Abundance' game sensitised students to the inequalities that they will face in their classrooms one day, and it poses challenges to the inclusive teacher

A very strong theme that emerged from the data was that students were sensitised to their role as future teachers to strive for equity in an unequal society. Students acknowledged the role of the game in sensitising them about these issues – as can be seen in Figure 9.4: awareness ($n = 20$) and open-mindedness ($n = 22$) were mentioned by several students.

The game made student-teachers aware of their future role of being agents of inclusivity:

'The "Famine and Abundance" game was the aspect that I enjoyed the most because I learnt about the differences that learners will have in my classroom and how I should cater for them.' (Student teacher, Excursion A, 17 August 2021, unknown gender or race)

'I enjoyed the game and the fact that I was made aware of the challenges that I will be facing as a teacher and the solutions that I can use.' (Student teacher, Excursion A, 17 August 2021, unknown gender or race)

'Playing the "Famine and Abundance" game opened my eyes to things we sometimes overlook like economic situations of everyone is different.' (Student teacher, Excursion B, 19 August 2021, unknown gender or race)

'The highlight for me was the "Famine and Abundance" game – it taught me a lot about indifferences in schools and the gap between different family backgrounds.' (Student teacher, Excursion D, 26 August 2021, unknown gender or race)

'I learnt how teachers should be considerate of different backgrounds learners come from. Because it reminds us that people do not have the same opportunities and we need to accommodate all learners.' (Student teacher, Excursion F, 02 September 2021, unknown gender or race)

The comments also speak of the affective outcomes of the learning activity and how students enjoyed it:

'The "Famine and Abundance" game with the passports was the highlight for me. It was a fun activity that we could all participate in, but it still made all of us realise how fortunate some of us are and how some are less fortunate. It made us become aware of the problems not just in South Africa, but all around the world, and as a teacher we can always try to help and treat each student equal, no matter of their background.' (Student teacher, Excursion H, 09 September 2021, unknown gender or race)

Figure 9.4 summarises students' responses, in terms of the emotions that they felt. The gamification version of the 'Famine and Abundance' game took students on an emotional roller-coaster ride, swinging from happy (n = 141) to sad (n = 197). Creating awareness (n = 20) and the activity being 'eye-opening' (n = 11) came through strongly, and it is also supported by the above qualitative data that provide evidence that student-teachers could reflect on the 'Famine and Abundance' game in terms of the role of the teacher as an inclusive practitioner and a champion for social justice.

◼ Discussion

◼ Comparing students' face-to-face experiences (2016–2019) and online (2021) experiences with the 'Famine and Abundance' game

In true third-generation CHAT tradition (Engeström 1987), we juxtapose two activity systems in this section (see Figure 9.5): the face-to-face excursion as an activity system on the left, and the virtual, online excursion on the right. The 'Famine and Abundance' game in essence was the same in both activity systems with slight nuanced differences.

In both activity systems, the first-year student teacher is the subject. The object is becoming aware of social justice and equity issues, and what it means

Key:
T – Tools
S – Subject
R – Rules
C – Community
D – Division of labour
O – Object/objective

• Printed passports and money
• Actual food (a food banquet)
• Class discussion after the game
• Dramatisation

T

• Online platform
• E-Passports and virtual money
• Online shopping
• Small-group discussions

T

Contradiction of control

Becoming aware
of Issues of social
justice and equality, and
teacher agency

O   **O**

1st-year
student-
teacher

S

1st-year
student-
teacher

S

Face-to-face excursion

Virtual excursion

R   **C**   **D**   **D**   **C**   **R**

• MRTEQ and
guidelines for
teacher education
• Pedagogy of play

• Student-
teachers
• Facilitators

Teachers as:
• Facilitators of
learning
• Reflective
practitioners
• Agents of
change
• Inclusive
practitioners

Teachers as:
• Facilitators of
learning
• Reflective
practitioners
• Agents of
change
• Inclusive
practitioners

• Student-
teachers
• Facilitators

• MRTEQ and
guidelines for
teacher
education
• Pedagogy
of play
• CL guidelines

Source: De Beer and Mentz (2019:59).
Key: CL, cooperative learning; MRTEQ, Minimum Requirements for Teacher Education Qualifications.
FIGURE 9.5: Juxtaposing the 'Famine and Abundance' game during the face-to-face excursion with the virtual excursion as two activity systems.

in terms of teacher agency. Tools in both activity systems include the 'Famine and Abundance' game, with slight differences. During the face-to-face excursions (2016–2019), the students were provided with printed passports and 'Monopoly' money notes, with which they could purchase real food at the food banquet table (refer to Figure 9.6). This was followed by a discussion in the plenary session (with between 300 and 500 students present). For the virtual excursion, the game was adapted for an online learning environment, and students received an e-passport and virtual money that they could use to buy (fictional) food online. This was followed by first a discussion in small CL groups (of five students), after which the groups provided feedback to the plenary group. Rules refer to adherence to the Minimum Requirements for Teacher Education Qualifications (MRTEQ) framework in terms of preparing teachers as inclusive practitioners. In the case of the virtual excursions, we also adhered to the elements of CL, as developed by Johnson and Johnson (cf. ch. 8). In both activity systems, the community included the student-teachers and facilitators (both student facilitators and teacher educators).

FIGURE 9.6: (a) Students' passports determined what they could buy at the (b) food banquet table during the face-to-face excursions.

Division of labour (D) refers to the different roles envisaged of a truly inclusive teacher and includes being a facilitator of learning, a champion for inclusive education, a reflective practitioner, and an agent of change.

McNeil (2013) coined the term 'contradiction of control', which refers to a lack of alignment, or tensions, in terms of a shared object in two activity systems. In the case of both the face-to-face and virtual excursions, the 'Famine and Abundance' game succeeded in sensitising students towards the role of the teacher to strive for equity and social justice in the classroom. In terms of data set 2, Theme 3 speaks of this awareness of being a champion for social justice. Similarly, Sebotsa et al. (2020:310) have shown an increased awareness of agency and inclusivity in the context of the face-to-face excursions (data set 1). There is therefore little 'contradiction of control'. However, the data show nuanced differences.

It is clear, both from qualitative data in terms of data sets 1 and 2, as well as the reflections of the researchers, that the students engaged on a much deeper level with issues of inclusivity and social justice issues during the virtual online excursions. Data set 1 showed limited evidence of deep reflection in the case of the face-to-face excursions (Petersen, De Beer & Mentz 2020:143). The reason is that students grappled with this in their small CL groups (in the break-away rooms). During the face-to-face excursions, students provided feedback in the plenary session (with 300+ students present), and many students were not intellectually engaging with the topic at hand (De Beer et al. 2020). However, during the CL sessions in the break-away rooms during the virtual excursion, all students had to reflect on the 'Famine and Abundance' game activity and what it means for an inclusive teacher. The programme design in the case of the virtual excursion was therefore more conducive to promote deep reflection and critical thinking (personal reflections of the main facilitators). A 'tension' in the face-to-face excursion, in terms of realising the object of the activity system,

was that the design (students providing feedback in the large [plenary] group) prohibited all students from critically engaging with social justice and inclusivity. From this perspective, the 'Famine and Abundance' game was more successful in the online environment.

A tension in terms of realising the object in the virtual excursion was the fact that the same level of dramatisation that characterised the face-to-face excursions could not be replicated. For example, the 'shop keepers' during the face-to-face excursions rolled out the proverbial red carpet for citizens of industrialised countries when they came to buy their food (Sebotsa et al. 2020:301). In contrast, they often chased customers from developing countries away from their shops because they had so little money. This dramatisation further heightened the emotional experience that students had, and we will have to investigate how such dramatisation could also be a design feature in the virtual 'Famine and Abundance' game (cf. ch. 3). Also, students during the virtual excursions did online shopping without having 'real' food that they could show to their fellow students. De Beer and Henning (2011:3) refer to the affordances of creating 'cognitive, emotional, as well as visceral experiences', and 'having' or 'not having' food created such a visceral experience during the face-to-face excursions.

Another aspect that enhanced the impact of the 'Famine and Abundance' game during the virtual excursion was that it was better contextualised as part of an ill-structured problem. In the video (the video diary of the principal), one of the scenes dealt with the struggles of a learner from a socio-economically deprived environment, and this created a fertile environment on which to build. During the plenary session (introducing the game in the 'green room' [studio]), the game was well contextualised in terms of inclusion, and reference was made to the video that the students saw on the first day of the virtual excursion.

■ Conclusion

Data from the face-to-face excursions (Sebotsa et al. 2020) and the data presented in this chapter for the virtual excursion show that the 'Famine and Abundance' game – irrespective of whether it is a face-to-face or face-to-screen activity – holds affordances to sensitise student-teachers towards issues of inclusivity and social justice. The data shows that the gamification of the game resulted in affective learning gains and students developing more nuanced understandings of the role of the teacher as an inclusive practitioner and champion of social justice. The gamification ensured an emotional presence by students. However, future research should focus on the challenge of how some of the elements of the game that are present during face-to-face excursions (that is, the dramatisation effect) could be incorporated into a virtual online learning space.

Assessment of virtual excursions: Posters as self-directed multimodal assessment instruments

Anitia Lubbe
Research Unit Self-Directed Learning,
Faculty of Education, North-West University,
Potchefstroom, South Africa

Jako Olivier
Research Unit Self-Directed Learning,
Faculty of Education, North-West University,
Mahikeng, South Africa

Anette Hay[a,b]
[a]Focus Area Community-based Educational Research,
Environmental Education for Sustainable Development in Communities,
Faculty of Education, North-West University,
Potchefstroom, South Africa
[b]School of Mathematics, Natural Sciences and Technology Education,
Faculty of Education, North-West University,
Potchefstroom, South Africa

■ Abstract

It is a major challenge to identify assessment instruments for group work that not only support students' learning processes and progress but also reflect a

valid and reliable result based on individual efforts. In this chapter, we discuss the use of electronic posters (e-posters) as a multimodal assessment instrument for virtual excursions. The chapter involves a review of relevant literature on the use of posters embedded within CL. The value of posters as a multimodal assessment instrument, contributing towards the promotion of much-needed SDL skills (i.e. critical thinking, communication, and deeper learning), is central to this research. Qualitative data from students' self-assessments were analysed in order to present practical guidelines in terms of the implementation of e-posters as an assessment instrument for virtual excursions, as well as the affordances thereof in the first-year students' learning process.

■ Introduction

The recent COVID-19 pandemic expedited the demand for innovative online teaching, learning, and assessment practices. Not only did the pedagogies associated with traditional face-to-face teaching and learning undergo a metamorphosis, but excursions had to be rethought and reinvented as well (cf. ch. 1). Consequently, the assessment of such online learning endeavours should also be adapted to engage students as well as to promote their learning (Trowler 2010). The accelerated transition to virtual teaching, learning, and assessment created more opportunities for incorporating multimodal assessments (Olivier 2021; Ross, Curwood & Bell 2020; Tan et al. 2020).

The use of e-posters in this study is an example of an innovative self-directed multimodal assessment (SDMA) instrument. As such, the assessment artefacts form part of the wider genre of posters which have a rich history as succinct and effective mediums of multimodal communication (Guffey 2014). Consequently, this research drew theoretically from the literature of SDL, multimodal assessment, and SDMA as well as posters and e-posters as assessment instruments. These concepts are unpacked within this chapter, after which student reflections from self-assessments are qualitatively analysed in order to reach an understanding of how assessment can be done within the context of virtual excursions by means of e-posters as SDMA instruments.

This research addresses the needs expressed in the literature in terms of increasingly using alternative means of assessment within the digital context (Hung, Chiu & Yeh 2013), finding effective ways to be able to assess multimodal texts (Baldwin 2016) and the need for more research on student perceptions of multimodal assessments in different contexts (Blum & Barger 2018).

The focus of this study was on using students' perspectives on and experiences of e-posters as a form of SDMA to determine the affordances thereof for virtual excursions.

■ Problem statement

Despite the fact that the use of multimodal assessments within higher education is becoming increasingly important (Ross et al. 2020), research with regard to the implementation and influence of specific multimodal assessment tools within virtual excursions is uncharted waters within the higher education landscape. This prompted the use of e-posters as a summative assessment instrument during virtual WIL excursions. The importance of multimodal assessment as a means to support social justice through promoting the use of different modalities not commonly used for learning (Baldwin 2016), but also supports the need for this research.

As this chapter also considers SDL and the learning process, it was essential to plan specific learning strategies that could be supportive towards self-directedness and hence, CL was implemented as part of the e-poster SDMA process. According to Silalahi and Hutauruk (2020), CL is an instructional pedagogy that can successfully promote learning in an online environment. Within the social constructivist paradigm, despite social distancing, this approach is especially important. However, the successful implementation of any type of group work (including the planning, facilitation, and related assessment) remains challenging and problematic (Soetanto & MacDonald 2017; Windscheffel 2019), even more so in an online learning environment (Smith et al. 2011).

A detailed discussion of how CL was conceptualised and implemented within the virtual excursions is provided in Chapter 8. As assessment practices that are embedded within cooperative learning have been proved successful in promoting learning and developing SDL skills (Lubbe 2020), the e-posters was conceptualised as cooperative learning-embedded assessment (CL-EA). During Lubbe's (2020) study, CL-EA was implemented during traditional face-to-face instruction and not in virtual settings.

Our aim was to develop new insights into the affordances of e-posters as a multimodal assessment instrument for virtual excursions, as well as to introduce a framework for multimodal assessment that can guide future research in this area. The question that directed this research was: What are the affordances of e-posters as a multimodal assessment instrument during virtual excursions?

■ Theoretical and conceptual framework

The central concepts of this study, which was theoretically rooted within social constructivism (Vygotsky 1978), are SDL, multimodal assessment, SDMA, and the use of e-posters as assessment instruments. Within this theoretical foundation, social interactions are central to the process of acquiring skills and knowledge, and social group learning as well as collaboration between peers are important strategies (Schunk 2012). Furthermore, Rannikmäe,

Holbrook, and Soobard (2020) make the following important observation regarding social constructivism:

> Social constructivism focuses on a social nature of cognition and suggests approaches that facilitate a community of learners to engage in activity, discourse and reflection, encouraging students to take on more ownership in the putting forward of ideas to share with others and to pursue autonomy with a view to interacting in mutual reciprocity in dealing with social relations. (p. 264)

It is then specifically within this context that SDL as a learning process is approached.

Self-directed learning

Self-directed learning has been discussed in detail in previous chapters (cf. ch. 5 and ch. 6). For the purpose of this chapter, SDL will be discussed from a Knowlesian point of view and as a mindset to embrace self-direction (Rens, White & Botha 2020). Since the mid-1900s, self-direction has been the focus of research within the field of adult education. A variety of terms developed through the years, such as self-education, SDL and self-planned learning. In all these cases, the focus is on the 'self', which implies that the individual student has to take responsibility for their own learning. In its broadest meaning, Knowles (1975) defined SDL as:

> [*A*] process in which individuals take the initiative, with or without the help of others, in diagnosing their learning needs, formulating learning goals, identifying resources for learning, choosing and implementing appropriate learning strategies, and evaluating learning outcomes. (p. 18)

Nevertheless, SDL refers also to students' accountability and responsibility during group work which links with the deliberate decisions students make in order to manoeuvre their own learning (Havenga 2016). In order to make informed decisions, the best way to direct the learning process is to set learning goals. Merriam, Caffarella, and Baumgartner (2007) described the following as the main goals of SDL:

> [*T*]o enhance the ability of students to be self-determined in their studies, to foster transformational learning, as well as to promote emancipatory learning and social action as an integral part of SDL. (p. 8)

For self-determination, SDL initiates students to relate to their own learning experiences by planning, carrying out and reflecting on their experiences. Moreover, self-initiated learning should be accompanied with a sense of discovery coming from within (Rogers 1983). This is in line with what Knowles (1975) once said that internal motivations are usually more effective and consistent because students will have a self-motivated desire to learn and to change. Merriam et al. (2007) referred to a second goal, namely to foster transformational learning, which emphasises the critical reflection process leading to transformational learning. According to Koç Akran and Epçaçan

(2018:539), 'transformational learning can be defined as the stage in which experiences and structural differences are formed, changes in feelings, thoughts, and in behaviours are observed and new perspectives arise'. Merriam et al. (2007) referred to a third goal, namely the promotion of emancipatory learning and social action. It is believed that the ability to reflect critically will enable students to liberate themselves and exercise social activities which are positive and helpful (Freire 1970). To put it differently, students cannot be independent if they are not responsible and accountable for their choices, actions, and consequences.

Finally, SDL, according to Okoro and Chukwudi (2011), is an approach to learning which supports students being actively engaged in their learning processes in order to obtain vital 21st-century skills. Within this process, assessment has a key role to play in terms of SDL (Lubbe 2015, 2020; Lubbe & Mentz 2021). However, the focus of this chapter was explicitly on multimodal assessment.

■ Multimodal assessment

Because of the increased use of technology and an awareness of the use of different communicative modalities, there has been a distinct move away from text-based assessments in higher education towards the use of multimodal assessments. Such multimodal assessments imply different modes of communication as semiotic resources (Bezemer & Kress 2016; Canale 2019; Ross et al. 2020). Consequently, the use of multimodal assessments, such as the posters employed in this research, is a way in which multiple modes could be accommodated.

In support of multimodal assessment, Ross et al. (2020:292) emphasise that 'multimodal texts are often collaborative in nature and can challenge students to critically consider places and mobilities in terms of their content, representation, and audience'. Furthermore, multimodal assessments have been widely used in language (Anderson & Kachorsky 2019; Kohnke, Jarvis & Ting 2021; Wood 2019) and science teaching (Smith et al. 2018), amongst other disciplines. It is important to note that such multimodal assessments require that students have certain multimodal literacies (Tan et al. 2020) which in conjunction with assessment literacy (Lubbe & Mentz 2021) are essential for any e-poster intervention.

Within the context of this chapter, using multimodal assessments for teacher training has also been used specifically towards creating supportive virtual spaces (Fukuda et al. 2019). However, little has been done in this regard within the South African context (cf. ch. 6). This chapter also links up with the scholarship on using posters as assessment instruments, as they tend to combine various semiotic resources, especially when they are created electronically. Consequently, with the additional focus on SDL, the issue of SDMA also needs to be considered.

Self-directed multimodal assessment

The concept of SDMA draws on the extensive literature on multimodality and SDL. The concept of SDMA can be defined as a dynamic assessment process as learning that is student-centred, enhanced by technology, driven by iterative and forward-feeding feedback, individually and collaboratively executed, adheres to multimedia principles, and is measured through an authentic task that may involve a multimodal artefact (cf. Olivier 2021).

The concept of SDMA has clear links with the wider learning concept of self-directed multimodal learning (SDML), which in turn relates to (Olivier 2020a):

> [*A*]n approach to education where individual modal preferences, communication through different modalities, as well as the blending of learning, teaching and delivery by means of different modes are employed with the aim of fostering self-directedness among students. (p. xxxiv)

An important aspect of SDMA is the concept of multimodal orchestration, which relates to the manner in which multimodal resources can be put together in order to form a specific artefact (Hafner & Ho 2020). Furthermore, the central role of the student for SDMA is important. In this regard, the following statement by Canale (2019) regarding student agency for multimodal assessments is highly relevant:

> Attending to the learners' situated agency in interacting and making meanings with curricular artifacts offers a unique path to recognizing the learner as a legitimate sign-maker and to recognizing as much of their learning as possible. (pp. 177–178)

Hence, within this research, the student agency potential of e-posters, as a realisation of SDMA, was the focus in terms of the possible implications for SDL. The specific SDMA instrument relevant to this chapter was posters and specifically e-posters.

Posters as assessment instruments

Higher educational institutions are exposing students during their 4-year journey to innovative and high-quality SDL opportunities, accompanied by a variety of assessment instruments to evaluate learning. One of these SDL opportunities is posters (Handron 1994). According to Handron (1994), a poster refers to:

> [*A*]n experiential learning activity that stimulates curiosity and interest, encourages exploration and integration of concepts and provides students with a novel way of demonstrating understanding. (p. 17)

According to Billington (1997), as well as Hay and Thomas (1999), posters have been utilised as assessment instruments in higher education since the 1990s. More recently, Howard (2015:1) highlighted a few positive roles posters can 'play in promoting students' engagement at undergraduate level when

making assessed submissions'. These positive roles include assisting students' learning, promoting enjoyment, as well as deeper learning, which include higher-order thinking skills.

Because group work allows for more creativity and problem-solving, it requires careful and meticulous planning in terms of assessment weighting (O'Neill & Jennings 2012). Menke (2014:1) states that e-posters allows students to do an in-depth research study on any specific topic and make use of more artistic ways to display their efforts and results.

Furthermore, posters can be excellent alternatives for not only the development of effective communication skills but also for engaging students in the processes of assessment (Berry & Houston 1995). Furthermore, posters encourage in-depth research, whilst providing opportunities for collaboration, promotion of positive student attitudes, as well as exploring and confronting misconceptions (Berry & Houston 1995). Assessment within social constructivism recognises the social nature of learning, including learning through assessment (Hassan 2011), and according to Handron (1994), posters encourage students to demonstrate their levels of comprehension. The creation of posters should also be considered within the context of what Canale (2019) calls *student-artefact interaction* as students act as sign-makers creating multimodal content.

☐ Guidelines for the implementation of posters

Implementing posters as assessment instruments should be guided by the following four principles (O'Neill & Jennings 2012:8):

Principle 1: A clear message which focuses on one key concept should be made. To convey the message, the creation of the poster must be treated as one process. A basic rule is to keep the message simple because it needs to be understood at a glance.

Principle 2: The design contains a few keywords or themes. The page can be subdivided into the relevant number of keywords or component parts whilst considering the size and layout (e.g. landscape, portrait or banner). Another aspect is the title of the poster, which is the focal point and needs to be catchy, clear, and colourful. The sequence of content is key because the reader must follow the poster content. It is important to number the parts or to use different colours that could be of help to indicate the 'path' through the text. The psychology of colour should also be considered because different colours could convey certain messages, for example warmth. Another aspect is to use less text and more graphics, but then permission to use animations, live creation of charts, talking heads, etc. must be granted from the respected owner or author.

Principle 3: The production process includes the printing of the final poster. This implies saving the final document in a portable document format (PDF), which will lock down all fonts, colours, and graphics.

Principle 4: Revision and awareness involve the final evaluation of the poster and to make sure the poster has minimal accessibility issues; for example, make sure there is a high contrast between the background and the text, or when graphics are used, understand the difference in formats used. This aspect underlies having sufficient document genre knowledge.

☐ Value of posters in students' development and learning

The value of posters is highlighted by Ross, Dlungwane, and Van Wyk (2019), especially when using posters to conduct an assessment with large classes. This allowed for 'quick and efficient marking, immediate feedback, and an opportunity to validate the students' participation' (Ross et al. 2019:1). Furthermore, posters may offer 'an innovative way to encourage deep meaningful engagement and learning amongst peers and facilitators' (Ross et al. 2019:1).

The value of posters for Brown and Knight (1994) lies in students being able to consolidate their findings, which leads to an enhanced understanding of the researched topic.

Another value of posters is that this helps students to prioritise and focus on the key evidence required (Jarvis & Cain 2003). Moreover, Conyers (2003) mentioned that posters provide a means of encouraging learning amongst students. Students will be more creative, and this is therefore an effective means of developing both research skills and creative abilities (McNamara, Larkin & Beatson 2010), as well as communication skills in their poster assignment. In this regard, Grace (1996) mentioned poster assessments enabled students to interact with others in a less formal way. Furthermore, Kinikin and Hench (2012) elaborate and emphasise that the poster assessment format provides a nonthreatening environment and encourages learning amongst students.

McNamara et al. (2010:6) incorporated posters in their WIL programme and highlighted the following benefits: posters '[…] encourage students to reflect on their learning during their internship and enable students to demonstrate their learning and to learn from other students' experiences'. Kinikin and Hench (2012:87) used posters to judge 'the development and application of knowledge together with analysis, synthesis, and evaluation of library research and information skills'. It seems as if poster assessments opportunities can provide for the development and improvement of students' cognitive skills as they progress through Bloom's scale of taxonomy (Kinikin & Hench 2012).

■ Research methodology

■ Research paradigm

The qualitative research done in this chapter is underpinned by an interpretivist research paradigm. This paradigm was chosen as we regard that 'reality and

knowledge are constructed and reproduced through communication, interaction, and practice' (Tracy 2020:51). This view also informed the hermeneutical approach followed in terms of our inductive analysis of the student responses.

Research design

This study followed a qualitative research design to answer the research questions. In this context, our research can be described as basic qualitative research (cf. Merriam 2009). According to Merriam (2009:23), qualitative research studies seek to understand '(1) how people interpret their experiences, (2) how they construct their worlds, and (3) what meaning they attribute to their experiences'. Furthermore, according to Merriam (2009), qualitative studies are rooted in social constructivist and interpretivist research. For the purpose of this study, the interpretivist qualitative research design aligns with the research aim as well as the research question.

Research ethics considerations

Throughout the research process, we adhered to the national and institutional ethics guidelines and policies. The data used for this research were collected only after an ethical clearance process was completed and gatekeeping permission was obtained from the relevant committee of the university where the research was conducted. To this end, the research reported in this chapter is part of a project with the following research ethical clearance number: NWU-00487-17-A2.

Furthermore, data were only analysed if the relevant participants provided informed consent for the data to be used. Participation in the research was totally voluntary, and participants could withdraw from the research at any time. In order to eliminate any form of coercion, the recruitment process and obtaining of informed consent were handled by an independent person. The privacy and confidentiality of participants were also ensured throughout the process.

Sampling and data collection

This research involved convenience sampling (Tracy 2020) as the researchers used all the data from which the participants who attended the WIL virtual excursion and who were willing to take part in the research. In this regard, the corpus of data involves 245 completed open-ended self-assessments from participants who provided informed consent for their data to be used.

The virtual WIL excursion forms part of the WIL modules – depending on the phase registered. It is compulsory for all first-year BEd students, and students had to book one of the 13 two-day virtual excursions (cf. ch. 3). As part of the virtual excursion, all students were required to compile e-posters

within their respective CL groups (cf. ch. 8). The corpus of data in this study was an open-ended question to be discussed in a group context within a two-day virtual excursion. The question posed to the students was:

> After the two-day virtual excursion, your group will have the opportunity to communicate online to compile an electronic-poster, in which you will critically reflect on the excursion programme by providing solutions to the many challenges the principal faces as portrayed in the case study video.

The posters encouraged first-year students to identify problems and summarise possible solutions in a concise multimodal format, using text and other modalities (e.g. pictures). The posters were assessed using a predetermined rubric (Table 10A-1), enhancing external marker reliability and allowing the team of markers to grade the posters in relation to students' ability to articulate and justify possible solutions to identified authentic problems, the standard of visual presentation, as well as their ability to reference appropriately. To further enhance external marker reliability, markers were also provided with a document containing guidelines for the use of the rubric when interpreting the e-posters. This guiding document was compiled after three internal markers assessed three e-poster submissions each. Peer and self-assessment methods were also implemented and contributed to the final poster grading. The first-year students were randomly divided into online CL groups for the duration of a virtual WIL excursion (cf. ch. 8). Students had to construct an e-poster within their assigned CL groups, utilising the group roles discussed in Chapter 8.

Because creating posters might be a new form of assessment for first-year students, they were supported and guided in accordance with the principles noted by Howard (2015). Students were therefore provided with a supporting document to assist them in creating their e-posters. This document contained guiding principles on the following aspects: planning their posters, image copyright aspects, choosing an appropriate electronic platform, poster layout, how to interpret the rubric, how to use the peer and self-assessments, as well as the submission procedure (Figure 10A-1). For the purpose of this chapter, the self-assessments (Figure 10A-2) of all students who provided informed consent were analysed.

■ Data analysis

In this chapter, the data analysis was handled inductively as codes and themes (Saldaña 2009) were derived from a careful analysis of the open-ended questions' responses. Tracy (2020) highlights that with inductive research, specific elements are observed, general patterns are derived, tentative claims are made and re-examined, and only then conclusions could be drawn.

Firstly, all the data were anonymised after which they were uploaded and shared amongst the researchers for pre-analysis reading. The analysis itself

was then conducted collaboratively by means of ATLAS.ti™. This process involved careful reading and identification of relevant quotations that were then coded thematically. This was followed by a process of categorising and recategorising under subcategories and ultimately themes (cf. Saldaña 2009). Finally, the synthesis of the analysed data allowed the researchers to be able to discuss broad trends and come to certain conclusions. Hence, this research involved a phronetic analysis as the researchers focused on 'use–inspired, practical research that not only builds theory, but also provides guidance on social practice and action' (Tracy 2020:210).

■ Trustworthiness

The trustworthiness of the analysis in this research was supported by what Tracy (2020) calls the three core qualitative concepts. This refers specifically to self–reflexivity, context and thick descriptions. In this regard, because of the collaborative nature of the data analysis, the researchers were able to engage reflectively about the process as well as their own points of view and biases. Throughout the reporting of the research, the context was clearly explained to contextualise and situate the data within a specific context. Finally, the researchers immersed themselves within the research context by attending the sessions of the virtual excursion to understand the complexities of not only the participants but also the online environment.

■ Findings

Using the data from the self-assessments, as well as the SDMA e-poster artefacts, we draw attention to the contribution made towards academic gains, positive affectivity, SDL skills development, and social competency. Furthermore, issues around e-posters as multimodal artefacts as well as application or platform supporting SDMA are presented.

■ Theme: Academic development

It is evident from participant responses that the sharing of ideas and brainstorming contributed towards their learning. One participant noted that the best part of the assessment task was:

> '[*W*]hen we were discussing our ideas as a group, the energy of all the other group members was contagious, and it motivated me to do my best. It feels nice to be encouraged by the other group members as it motivates you to become more involved with the assignment.' (Student, Question 2, Group 35)

The following quotations also have reference to this specific communal contribution towards student learning:

> 'Getting everyone's inputs and ideas because everyone sees the problems and solutions differently and from that I learned a lot.' (Student, Question 3, Group 63)

'Doing activities and discussing topics in groups and seeing how different the outcomes is from different perspectives.' (Student, Question 3, Group 86)

The real-life and authentic nature of the assessment task seems to have had a positive influence on the participants' learning gains, and one student noted that:

'[A]fter completing this activity with my group, I felt more knowledgeable because this activity has opened my eyes on real-life problems and experiences teachers can face and how you should go about finding a solution for them in the right way.' (Student, Question 5, Group 72)

Noteworthy is the fact that participants indicated that their academic development was a result of students taking responsibility for their own learning. In this context, the following responses were relevant:

'[T]aking part in the e-poster and taking responsibility for what was expected from me by my group members.' (Student, Question 3, Group 8)

'Sitting and discussing within the group, learning and seeing other people's opinions based on our different backgrounds and other people's creative views.' (Student, Question 3, Group 61)

It is worth noting that students not only gained knowledge on the authentic problems and solutions dealt with in the assessment task, but students acquired more knowledge on the use of ICT applications:

'I enjoyed learning how to use Google Docs.' (Student, Question 3, Group 13)

'Designing the poster and having the opportunity to play around on Canva.' (Student, Question 3, Group 20)

Although most participant responses indicate that their involvement in the e-poster assessment instrument, as conceptualised within this study, had a positive influence on their academic development, there is room for improvement. Specifically, the need for more clarification on 'who the audience of the poster was' (Student, Question 4, Group 20) was highlighted as a limiting factor. Furthermore, it was indicated that an exemplar would have added value to the learning experience:

'[G]iven a short example on the e-poster.' (Student, Question 4, Group 51)

Finally, the learning gains were perceived to be a blessing:

'After completing the activity, I felt blessed because I came out with a lot of knowledge from the activity.' (Student, Question 5, Group 147)

◼ Theme: Positive affectivity

The multimodal nature of the assessment task, CL environment within which the assessment task was completed, as well as seeing the final product (e-poster) were identified to have a positive impact on students' affectivity. Within this context, the following responses to Question 3 were relevant:

'I enjoy finding the images for the poster the most.' (Student, Question 3, Group 7)

'Looking out for different pictures, although it was a bit challenging, I really enjoyed it.' (Student, Question 3, Group 57)

'Meeting new people from different cultures and ages as well as working together was a positive experience.' (Student, Question 3, Group 54)

'The final product, seeing all of our work and opinions laid out into one pretty picture is such a rewarding feeling.' (Student, Question 3, Group 90)

'Choosing pictures for the poster.' (Student, Question 3, Group 133)

Identifying possible problems based on the authenticity of the e-poster content, as well as searching for possible solutions, were overwhelmingly enjoyed by the participants. This seems to point towards the importance of authentic SDMA tasks, purposefully structured within CL:

'I really enjoyed identifying the problems in the video, it helped me prepare for the problems I might have to face as a teacher.' (Student, Question 3, Group 114)

'I enjoyed writing about all the problems that the new principal faced and proposing solutions to each and every one of the problems identified.' (Student, Question 3, Group 148)

'I enjoyed coming up with solutions because I was reflecting on my high school years, and it was so exciting to address such issues affecting teaching and learning.' (Student, Question 3, Group 20)

It was also evident from the responses that the e-poster made students feel happy, proud, and empowered. Furthermore, a sense of accomplishment was highlighted:

'I felt proud because I feel my group did well and we gave our everything throughout the excursion.' (Student, Question 5, Group 8)

'I felt empowered because I was able to learn and be part of this amazing virtual excursion.' (Student, Question 5, Group 60)

The positive interdependence within the CL groups seems to have contributed to the positive affectivity of students. The following responses are noteworthy:

'After completing the activity, I felt valuable since some of my ideas were used during the e-poster, because on the other hand, I am Quality Controller, so I had to make sure that everything is in order and we have an agreement.' (Student, Question 5, Group 11)

'Great because as a group we are helping each other how to reply to members and how to create an e-poster using the ideas of the excursion.' (Student, Question 5, Group 24)

'I felt motivated, energetic, and happy, because I have learned a lot from my fellow energetic group members on the solutions of the problems observed from the video.' (Student, Question 5, Group 53)

'I enjoyed my topic the most, the role I had within the team and basically just doing my work was a lot of fun because it was a first for me. I definitely think I enjoyed my role within the team the most and assisting everyone.' (Student, Question 5, Group 130)

'Creating our poster was very enjoyable because we were helping each other. It was so nice and fun.' (Student, Question 3, Group 135)

On the other hand, not all participants felt that the e-poster contributed towards their affectivity. The absence of positive interdependence within a particular group was indicated to negatively impact their affectivity. The following student indicated that they could have done a better job if 'all the group members worked together' (Student, Question 4, Group 81). Furthermore, it is evident that the cooperative nature of the SDMA task was not enjoyed by the following participants:

'I did not really enjoy the poster, as it was a bit difficult from my side.' (Student, Question 3, Group 31)

'No real enjoyment. I do not enjoy making posters.' (Student, Question 3, Group 94)

Hence, in some cases, further support and interventions may be needed to support students experiencing challenges throughout the SDMA process.

■ Theme: Self-directed learning skills development

From the analysis of students' responses, it is evident that the e-poster contributed towards the development of SDL skills (cf. ch. 5). Students' abilities to identify their own strengths and weaknesses were indicated, specifically with regards to helping others, working well under pressure, and lack of communication and technology skills. The following quotations were relevant:

'Personally, yes, I could have pushed myself harder to learn more from my peers in this group. Every day in our lives is an opportunity to learn and to better ourselves. It is just a matter of what you make a priority.' (Student, Question 6, Group 64)

'I learned that I am a great leader, and I can work well with different individuals. I also learned that I could motivate individuals to reach their full potential.' (Student, Question 6, Group 6)

'I've learnt that as a person I cannot have the answers to everything/cannot always have all the solutions to tackle a problem. That's why there's group work to assist one another, because each and every person has their own abilities and capabilities.' (Student, Question 6, Group 112)

'There is so much I still need to learn, I learned that I have the passion to be a teacher, I learned that my heart is in the right place, that I must be creative to avoid being the boring teacher.' (Student, Question 6, Group 141)

'I need to improve my communication skills.' (Student, Question 9, Group 6)

'I had more knowledge of technology that can be used in poster design.' (Student, Question 4, Group 25)

The ability to identify learning needs, formulate learning objectives, identifying and using relevant sources of information, and being motivated to learn are skills crucial to being more self-directed in one's learning (cf. Knowles 1975). The e-poster SDMA task seems to have enabled the participants to develop these skills, and in some cases identify the need thereof. Specifically, the

multimodal nature of the e-posters seems to have contributed towards the participants wanting to do research on the problems they enjoyed identifying:

'Looking at all the different problems and situations and trying to find images to suit the problem and solution.' (Student, Question 3, Group 131)

The ability to see peers as resources is an important 21st-century skill, especially within the context of social constructivism (cf. Knowles 1975; cf. Lubbe 2020). The cooperative nature of the e-posters, including the specific roles within the groups, seems to have enabled students to capitalise on the peer-learning opportunities:

'Reading everyone's ideas and learning from everyone.' (Student, Question 3, Group 10)

'I learnt some solutions to problems from my peers which will help me in the future.' (Student, Question 5, Group 47)

Noteworthy is that the opportunity to brainstorm ideas, provided by this CL SDMA task, not only enabled students to develop the ability to see their peers as resources but also contributed to positive affectivity:

'I felt motivated, energetic, and happy, because I have learned a lot from my fellow energetic group members on the solutions of the problems observed from the video. Now I feel ready to overcome some problems during my teaching career.' (Student, Question 5, Group 52)

In addition to the SDL skills, the data also showed promise in terms of social competency.

■ Theme: Social competency

It was clear from the analysis of the participant responses that the use of e-poster SDMA task contributed towards the development of social and communication skills, as indicated by the following response:

'I felt happy because I was able to learn communicative skills…' (Student, Question 5, Group 118)

Furthermore, participants indicated that working together on the e-posters was the part of the SDMA task which was appreciated the most:

'To interact with the other group members and to find the problems and solutions together.' (Student, Question 3, Group 17)

'Working with the group, they are amazing young women that will be excellent teachers and brilliant leaders in the education environment.' (Student, Question 3, Group 141)

Appreciating the cooperation between group members is linked to respecting each other's opinions (Johnson & Johnson 2014). One student noted:

'I enjoyed discussing it with my group members, then we made a decision together that will also help me to respect my colleagues' opinions.' (Student, Question 3, Group 23)

It should be noted that the preference for face-to-face interaction was only highlighted, as was the preference for working alone. In this context, the following participant response was relevant:

> 'I could have done a better job if I had the opportunity to meet my group members in person and plan the poster in person with them.' (Student, Question 4, Group 62)

This participant's response might be a result of inadequate Internet access, lack of time management and/or research skills and is evident in the participant's response to Question 2 (the e-poster was HARD/EASY to complete, because [...]):

> 'The e-poster was hard to complete, because it was difficult to find articles, journals, etc. to support our solution for the problems in the school.' (Student, Question 2, Group 62)

Evident from the following participant's response is the need for ICT skills in order to better utilise the online learning environment and consequently the e-poster:

> 'If it would have been possible to complete the poster in person with my fellow students, I feel when you do something in person it tends to turn out better than trying to do it over the phone or in messages, I also think we all could have done a better job if we were more used to doing things online and communicating with each other.' (Student, Question 4, Group 106)

Although preference for working alone was noted, several responses highlighted that they need to accept help from peers:

> 'Doing activities in groups of people that I don't know. I want to do things my way and I want to do everything on my own. I need to learn that you don't have to do everything alone, people can help.' (Student, Question 9, Group 5)

Not only is helping peers seen as a vital social competency, but the ability to be on the receiving end is as well (cf. Lubbe 2015). Another contributing factor towards the negative affinity to CL might be the lack of social and communication skills:

> 'What I learnt about myself the most is that I work better in group work. I have never enjoyed working in groups because it was hard for me when we had arguments [...].' (Student, Question 6, Group 99)

Interestingly, the rest of this participant's response is a clear indication of how the CL SDMA task provided the opportunity for 'dramatical collisions' (cf. ch. 8) and ultimately led to increased social competency:

> '[...] little did I know that arguments lead to perfection.' (Student, Question 6, Group 99)

Apart from the process-related elements, certain specific aspects related to the multimodal nature of e-posters were also noted in the data.

■ Theme: E-posters as multimodal artefacts

From the analysis of the participant responses, it was evident that there were some misconceptions on what a poster as a published genre entails. Baldwin

(2016) highlights the importance of genres and conventions in terms of multimodal assessment. Even from the earliest uses of posters, the emphasis has been on short and striking multimodal communication in order to convey specific semantic content (Guffey 2014). However, from the responses, it was clear that for the students, quite often the nature of written content was more important than the genre of the document itself.

Participants noted how the confines of posters limited the number of words that could be used, consequently ignoring the fact that the genre generally does not include a great deal of written content. In this context, the following quotations were relevant:

'[*T*]here were problems trying to fit all of the information on the poster.' (Student, Question 2, Group 3)

'I found it difficult for everything to fit on the page […].' (Student, Question 2, Group 7)

From these quotations issues around the framing (Kress & Van Leeuwen 2001) limitations of the document itself were raised and they were considered as being restrictive in terms of SDMA.

However, there was some evidence of participants having an appropriate sense of genre knowledge in terms of posters:

'[*W*]e needed to make the poster as simple as possible, yet it needed to be creative and not too hard to understand what the poster is saying.' (Student, Question 2, Group 4)

Because of the fact that e-posters were constructed within the frame of SDMA, the issue of multimodal orchestration would automatically be relevant for the composition of an artefact that employs various semiotic resources. The participants also noted this orchestration in their responses. One participant noted how this aspect was enjoyed:

'Finding the correct picture for the poster, and the picture had to go hand in hand with the content.' (Student, Question 3, Group 3)

The aspect of multimodal orchestration was also realised as 'layout' and the act of orchestration as 'compiling' within this corpus, and this also had a positive motivational purpose:

'Deciding on a layout and design was the most fun part of the e-poster.' (Student, Question 3, Group 6)

'The part of the e-poster which I enjoyed the most was colour-coding all the challenges and solutions together. I enjoyed laying out all the pieces of the e-poster to see which layout looks the best.' (Student, Question 3, Group 45)

'The compiling was the most enjoyable, as the ideas of the layout was endless.' (Student, Question 3, Group 67)

The use of an SDMA activity such as an e-poster highlights the importance of having choices not only in terms of semiotic resources but also in terms of the

multimodal orchestration by means of placement within an artefact. It is evident that the participants have some sense of the possible communicative value of placement as a resource.

Application or platform supporting self-directed multimodal assessment

For the purposes of consistency for this assessment relevant to this discussion, students were instructed to use MS Word to create a poster and submit it in a PDF format. However, from the responses, it is evident that participants acted proactively and independently in selecting appropriate software and online platforms in order to create their e-posters. In this context, the following statements were made:

> 'Designing the poster and having the opportunity to play around on Canva.' (Student, Question 3, Group 20)

Evidently, e-posters not only have advantages of the SDMA process but also specifically in terms of supporting elements of SDML.

Discussion

From the qualitative analysis, some key themes were derived. Firstly, it can be noted that the use of e-posters as SDMA instruments contributed to learning in a collaborative manner which aligns with the social constructivist view of learning within this research. Furthermore, having an authentic task dealing with an authentic problem was also received positively and taking responsibility for their own learning contributed to academic development. According to Hassan (2011) and Race (2015), deeper learning occurs when students are provided with the opportunity to verbalise their learning, as well as when regular self-assessment and peer assessment take place. The e-poster provided opportunities for students to brainstorm and share their ideas and consequently contributed to deeper learning (cf. section 'Theme: Academic development'). Furthermore, Conyers (2003) mentioned posters provide a means of encouraging learning and development amongst students. In this study, students' involvement in the e-poster assessment as well as the acquisition of ICT applications using applicable images contribute to their academic development.

Because of the importance of motivation to the learning process, it was highly relevant that the creation of e-posters had a notable positive impact on perceived student affectivity. As the e-poster assessment favoured a CL environment, this specifically resulted in a positive impact on student's affectivity. A sense of accomplishment was highlighted within this context. Additionally, the participants felt proud and empowered. Howard (2015) mentions how posters contributed to promoting enjoyment, and many of the responses in this research showed feelings of being motivated and positive.

From the analysis, there was clear evidence of SDL skills development amongst the students. Students were able to identify their strengths and weaknesses as well as their needs. Furthermore, they were able to identify their peers as learning resources. Merriam et al. (2007:8) have mentioned the enhancement of self-determination, fostering transformational learning, and the promotion of emancipatory learning as three main goals for SDL. The e-poster assessment as a multimodal artefact transforms learning to an extent where participants felt motivated and happy. Participants show positive interdependence – the enhancement of the self, or self-motivation. To put it differently, students cannot be independent if they are not responsible and accountable for their choices, actions, and consequences.

Social competency was a common trend as students were engaged in social and communicative activities which required relevant skills in this regard. Moreover, students specifically appreciated being able to work together on the e-poster creation. However, some students indicated that they preferred face-to-face interaction, and this links up with the idea of there being student preferences that need to be considered in terms of individual multimodality (Olivier 2020b) in SDML contexts. Additionally, the impact of access and skills in terms of technology also impacts modal preferences. Providing assistance to peers, working together, working with a group, and respecting each other's opinions could be seen as a vital social competency. O'Neill and Jennings (2012) indicated that posters are an excellent alternative medium for developing communication skills. It is therefore an effective means of developing both research skills and creative abilities (McNamara et al. 2010). From the qualitative analysis, a distinct lack of awareness in terms of the communicative impact (McGrail & Behizadeh 2017) of the e-posters was evident. In this regard, it might be sensible to emphasise the communicative role of the artefact instead of the production in itself being the only goal on the side of students.

Despite positivity towards creating e-posters as a medium, the data showed that students did not always have extensive knowledge and experience with the medium and that further scaffolding and support in being able to create effective SDMA artefacts would be necessary. However, e-posters do emphasise student agency in terms of selecting semiotic resources as means of communication within an SDMA (Olivier 2021) and SDML (Olivier 2020b) context. Finally, making use of certain online platforms also shows promise.

■ Recommendations

Firstly, the use of e-posters as SDMA is strongly recommended within online settings such as virtual excursions. However, it is essential to have clear instructions, and elements such as describing the intended target audience should be noted.

Despite a general positive impact on student affectivity as well as evidence of positive interdependence within the CL groups, there were some participants who did not like the task. Hence, it is recommended that the nature of group composition and support to students throughout the process be carefully considered.

Student preferences in terms of face-to-face collaborative opportunities should be considered and, where it is technically possible, should be made available as an option. However, from some student sentiments, additional support for skills to be able to create e-posters might be needed.

In line with Olivier's (2021) conceptualisation of SDMA, the assessment criteria might need to be revisited and rethought in order to consider criticality, holism, and creativity (Ross et al. 2020).

From the analysed data, there was little evidence that this cohort of students exploited the multimodal opportunities e-posters provide in terms of interactivity and integration of various modes of communication. Hence, it is recommended that appropriate poster-creating platforms are used and students' capabilities in this context be supported and scaffolded as part of the SDMA process.

It is evident that software or online platforms should also be considered as essential parts of SDMA. In a similar fashion, as learning resources (cf. Knowles 1975) can be selected within the SDL context by students, so should choices regarding technologies also be considered in the planning for SDMA. In future, it is proposed that different software options also be actively encouraged.

A further aspect of future development of the concept of e-posters used for this research would be to explore opportunities for collaboration, not only between the writers of multimodal artefacts but also the intended audience (cf. McGrail & Behizadeh 2017).

In a wider sense, assessment within the virtual excursion space will have to be responsive to technological developments in terms of new platforms and applications. In this regard, a challenge would be to exploit the affordances of AR and artificial reality in excursions (Denysenko et al. 2020) in terms of SDMA.

∎ Limitations

From this research, generalisations cannot be made for wider populations regarding the findings in terms of e-posters or SDMA as the population covered students from a specific faculty and at a specific institution. However, the findings may inform the wider scholarship of e-posters.

A major gap in the research was the fact that although the researchers intended to include a multimodal analysis of the created e-posters as part of

this chapter, insufficient numbers of posters were received and could be included as a data source. In this regard, in order to adhere to research ethics requirements, all members of the relevant groups involved in creating the posters had to provide informed consent for the artefact to be used for research purposes. Because of the low number of artefacts for which this could be obtained, the researchers chose to eliminate the student artefacts as a source of data. Moreover, an in-depth analysis of such artefacts might in any case warrant a separate study.

Furthermore, the research was also limited in focusing on the SDMA artefact, as the creation process itself could not be observed. This can also be a potential future avenue for further investigation.

■ Conclusion

The chapter related to a way in which assessment can be done within the context of virtual excursions. In this regard, we specifically explored the affordances of posters as SDMA instruments. Within a multimodal environment like a virtual excursion, we have found that e-posters are effective tools towards support for collaborative assessment practices that are in support of SDL. Furthermore, the use of this specific SDMA instrument lends itself to a positive impact on student affectivity and support for positive interdependence within the CL groups. The use of e-posters also resulted in the development of SDL skills such as being able to identify their needs and resources. Furthermore, social competency was quite important for successful e-poster creation and this aspect was appreciated by students, despite some preferring face-to-face activities which may be because of personal preferences and access and capabilities with technology. Finally, the multimodal nature of e-posters also prompted certain concerns regarding genre knowledge but overall provided many opportunities and positivity on the side of students.

■ Appendix

TABLE 10A-1: Rubric which will be used to assess the e-posters.

Criteria	Poor 1	Fair 2	Average 3	Good 4	Excellent 5
Appropriate title	No title included	The title is excessively too long *and* irrelevant	The title is too long *or* irrelevant	The title is relevant but can be better formulated	The title is appropriate and well formulated
States the problem(s) clearly	Problem(s) not evident	Problem(s) is wrongly identified	Problem(s) is vague	Problem(s) is implicit	Problem(s) is clearly identified
Literature search or research	Little to no evidence of a literature search	Students did not demonstrate good research skills	Research is minimal	Students demonstrated a good understanding of their research	Students went above and beyond for their research
Outlines the solution(s)	No solution(s) presented	Only one solution vaguely presented and not clearly discussed	Solution(s) vaguely presented and discussed	Solutions are implicit. A clearer discussion would have been helpful	Solutions are clearly discussed
Structure and organisation of poster	There is no sequence of information	There is no concise sequence of information and/ or so much is missing that the poster makes little sense	Information is inconsistently organised	Information is presented in a logical sequence. More or less information would have been helpful	Adequate information is presented in a logical sequence
Effective use of electronic platform	Inappropriate platform selected		Platform somewhat appropriate, but not effectively used		Excellent use of appropriate platform
Usage of graphics or images	No graphics or images used	Graphics or images are not clear or relevant	Few of the graphics or images are clear and relevant	Most of the graphics or images are clear and relevant	Excellent use of clear and relevant graphics and images
Referencing	No referencing included	In-text and reference lists have several errors	In-text and reference lists have 3–5 errors	In-text and reference lists have 1–2 errors	Excellent referencing, both in-text and reference list
Spelling and grammar	The poster has multiple spelling and grammar errors	The poster has 7–10 spelling and grammar errors	The poster has 3–5 spelling and grammar errors	The poster has 1–2 spelling and grammar errors	The poster has excellent spelling and grammar
Aesthetics	Distractingly messy; not attractive; too large or too small	Somewhat attractive, although several elements are messy	Somewhat attractive, although there is room for improvement	Attractive in terms of design, layout, and neatness	Exceptionally attractive in terms of design, layout, and neatness; correct size

Planning your poster – Your group will have 3 weeks to complete and submit your poster. The following guidelines might be useful to ensure that you create and submit an excellent e-poster in time (the Facilitators can use this to assist their groups with staying on track):

When	What
3 weeks out	Create a poster plan and select a suitable electronic platform for the compilation.
	Create the first draft of the poster.
	Each group member should keep a reflective journal of their experiences.
2 weeks out	Create or search for graphics and suitable images.
	Edit the draft ruthlessly.
	Each group member should keep a reflective journal of their experiences.
1 week out	Apply final edits and save as a PDF.
	Make a backup to a USB key.
	Distribute to all members one last time for final checks (e.g., language, etc.).
	Complete the self-assessments and peer assessments.
0	Submit ALL self-assessments and peer assessments to the Materials Manager.
	Materials Manager to submit the final copies via the Google Forms link.
	Please take note that the submission date for your e-poster will be 3 weeks after your excursion (see the table below when your group should submit your assignment). This will be marked shortly after we receive it to prevent a bottleneck situation for our markers. NO LATE ASSIGNMENTS WILL BE ACCEPTED.

- *Image copyright* – You may use any photographic images that you have taken or that you own; however, you are not allowed to use images from other sources (e.g. websites or books) without first obtaining written consent. Therefore, we would like to suggest you make use of graphics that are free (e.g. freepik. com). Please remember to reference your graphics as well.
- *Electronic platform* – You may use any suitable electronic platform for your group's poster (e.g. Word, PowerPoint, Google Sites, etc.). Please keep in mind, however, that the poster must be submitted as a **PDF document**. NO other formats will be accepted.
- *Poster Layout* – Your poster can either be landscape or portrait but should not be larger than A4. Remember that a poster is a visual display and should not only contain text, and the graphics should be self-explanatory. However, the use of graphics (i.e. images) should enhance understanding and not complicate it.
- *Submission procedure* – Your group's e-poster should be submitted via Google Forms by using this LINK. **Only ONE poster should be submitted per group** – therefore ONLY the Materials Manager should upload your group's poster. Please make sure that you provide your Materials Manager with your name, surname and student number, because the Materials Manager will have to submit the details of ALL group members on the Google Forms platform BEFORE submitting the e-poster. The Materials Manager will also be responsible to submit each group member's self-assessments AND peer assessments. ALL these documents should also be submitted as PDF documents. It is the responsibility of the Quality Controller to ensure that all group members completed their self-assessments and peer assessments AND that it is submitted to the Materials Manager.
- *Rubrics* – The rubric which will be used to assess your poster is included in this document. **Please make sure that your group carefully and critically reads the rubric so that you fully comprehend what is expected to be included in your poster.** Should your group have any questions regarding this, it will be the Communication Specialist's responsibility to seek clarification on behalf of the group.
- *Self-assessment* – Each group member will be expected to complete the reflection document (see below) as self-assessment. This document should also be converted to a PDF document and sent to your Materials Manager for submission.
- *Peer assessment* – Each group member will also be expected to assess the other group members based on certain criteria (e.g. how well they functioned within their specific role, their contribution, etc.). The instrument which should be used is included below and should also be sent to your Materials Manager as a PDF document.

FIGURE 10A-1: Things to take note of when compiling your e-posters.

Submit your self-assessment to the Materials Manager as a Word document (please follow this link to obtain a copy of this assessment in a Word format). Materials Managers should copy and paste all group members' self-assessments on ONE Word document, then convert it to a PDF document before uploading on Google Forms.

Please reflect on your experience by completing each of the following sentences:

1.	The excursion was …	
2.	The e-poster was (HARD/EASY) to complete, because …	
3.	The part of the e-poster which I enjoyed the most was …	
4.	I could have done a better job if …	
5.	After completing the activity, I felt … because …	
6.	What I learned most about myself is …	
7.	What I learned most about becoming a SUPER-teacher is …	
8.	I think cooperative learning …	
9.	Areas where I still need to improve/develop, are …	
10.	One day when I teach, …	

FIGURE 10A-2: Self-assessment.

'Withitness' in the virtual learning space: Reflections of student-teachers and teacher-educators

Josef de Beer
Research Unit Self-Directed Learning,
Faculty of Education, North-West University,
Potchefstroom, South Africa

Neal Petersen
Research Unit Self-Directed Learning,
Faculty of Education, North-West University,
Potchefstroom, South Africa

Lloyd Conley
Office of the Executive Dean, Educational Leadership,
Faculty of Education, North-West University,
Potchefstroom, South Africa

■ Abstract

The success of the face-to-face student excursions could partly be ascribed to the facilitators' 'withitness'. Withitness refers to the ability of the teacher to be perceptually and cognitively alert and aware of all aspects of their classrooms at all times. This chapter explores what withitness entails in a virtual online

learning environment. The authors explore how withitness could manifest in the face-to-screen learning environment and shed light on constructs such as the ripple effect, overlapping, momentum, smoothness, group focus, transitions, satiation, and pedagogical tact. The chapter further builds on a Community of Inquiry theoretical framework (Garrison, Anderson & Archer 2000) and explores cognitive presence, social presence, and teaching presence in a virtual learning space. The withitness model is an elusive construct and difficult to research. The findings discussed in this chapter emerge from an analysis of the feedback provided by student-teachers (*n* = 1 069) on their virtual excursion experiences, as well as the reflections of the teacher-educators (facilitators) (*n* = 4). In this mixed methods research, we draw on quantitative data collected during online opinion polls, as well as qualitative data collected through open-ended questionnaires. We utilised the coding technique described by King et al. (2005), where *a priori* codes were used as headings for columns in a matrix, and transcribed data were entered into specific cells in the matrix based on their adherence to these *a priori* codes. These *a priori* codes were withitness, the ripple effect, overlapping, transition, satiation, and pedagogical tact.

■ Introduction

The initiative to engage first-year student-teachers in excursions was launched by UJ in 2007. Since its inception, the excursion was characterised by rhizomic development, based on DBR. The initial excursion for the first-year BEd students had a strong focus on environmental education, as it was facilitated by South African National Parks, in the Golden Gate Highlands National Park, in the Eastern Free State. Since then, rhizomic development has characterised this excursion (Taljaard 2018), as in true DBR tradition, the facilitators (teacher educators) continuously adapted the excursion curriculum based on student feedback, as well as research on the affordances of these excursions and the curriculum outcomes. The UJ teacher educators in 2008 and 2009 started to alternate environmental education learning activities with activities related to professional conduct of teachers, inclusive education, and engaging pedagogies (De Beer, Petersen & Dunbar-Krige 2012). The excursion programme therefore became more focused on learning activities that would develop more nuanced understandings of the complexity of the teaching profession. At NWU, the focus again shifted towards approaches to mainstream SDL. It is the ability of the teacher educators to respond to what unfolded during the excursions that guaranteed the relevance and sustainability of it. For example, De Beer et al. (2012) describe how a student was confronted with his or her own biases resulting from a racist upbringing and how an event during the excursion in the Golden Gate Highlands National Park made her reflect on how her worldview might affect her future career, in terms of being inclusive. This particular student reflected on her own 'othering' of people,

fuelled by a racist father and conservative upbringing. The excursion event catapulted reflective teaching and the setting of individual learning goals in order to become a more inclusive teacher. De Beer and Henning (2011) describe such reflection flowing from excursion events as 'dramatical collisions', a construct coined by the Vygotskian scholar, Veresov (2004). Veresov describes such 'dramatical collisions' as a contradiction between the learner's level of development and the demands of the social surroundings. In this case, there was a contradiction between the world views and values of the student teacher and the expectations of an inclusive teacher in a democratic South Africa. The excursion therefore provides scaffolding for learning across the Vygotskyan ZPD (Vygotsky 1978). Based on such experiences (or 'dramatical collisions'), changes were made to the excursion programme to ensure that inclusivity and dealing with diversity was a strong focus.

The NWU started to offer similar excursions to first-year BEd students in 2016. A particular need for the excursion in this context was to provide students on the different campuses (Potchefstroom, Mahikeng, and Vanderbijlpark) and ODL students a 'sense of belonging' within the unitary university structure. De Beer, Smith, and Jansen (2009) show how sensitive HEIs which experienced historical mergers (that took place in 2004) should be about students' perceptions and their sense of belonging. The latter authors describe how students at the University of Pretoria's Mamelodi Campus, in 2005, internalised their 'social speech' (unhappiness about the programme on the Mamelodi Campus), and the internalised, egocentric speech negatively impacted on their sense of belonging and eventually on their academic performance. A sense of belonging can be described as a student's subjective feelings of connectedness or cohesion to the institution (Maestos, Vaguera & Zehr 2007), and through the lens of relational ontology, which acknowledges that learning occurs in the realm between individuals and their subjective worlds, it could be argued that it could negatively influence academic performance. In Chapter 2, it was described how the NWU was established from the merger of three institutions in 2004, and given the fact that the Mahikeng Campus, until today, has predominantly black students, the NWU is cognisant of the fact that attention should be given to students' sense of belonging. The face-to-face excursions were therefore conceptualised to bring students from the three campuses together and to learn together in CL groups. One of the goals of the excursions (and in this context, the virtual excursions) is that this interaction would assist students in developing a sense of belonging as an NWU student (and not only as a Potchefstroom, Mahikeng, or Vanderbijlpark campus student). This chapter, amongst others, also explores if the face-to-screen event succeeded in providing students with such a sense of belonging.

Based on the success of these excursions, whose outcomes have been published (De Beer & Henning 2011; De Beer et al. 2012; De Beer, Van der Walt

& Bunt 2020; Petersen, De Beer & Mentz 2020; Sebotsa, Petersen & Speight Vaughn 2020), the NWU successfully applied for a UCDG grant from the DHET, a grant for three years (2021–2023), as described in Chapter 2. Because of the COVID-19 pandemic, it was of course not possible to engage students in face-to-face excursions, as such an event with between 300 and 500 students would be a 'super-spreader' event. It was therefore decided to engage in virtual online excursions in 2021. However, this online, virtual learning space had to still provide a platform for 'dramatical collisions' and activities that would enhance a sense of belonging. In this chapter, we argue that the element of 'withitness' that characterised the face-to-face excursions should also be present in the virtual, online learning environment. These virtual excursions were synchronous sessions, and the students and facilitators gathered on the Zoom online platform in real time, in sync with one another (Craven 2020).

■ The 'withitness' model and related constructs

Kounin (1970) developed a model of withitness, and his model is based on six constructs, namely (Conley & Du Plessis 2015):

- withitness
- the ripple effect
- overlapping
- momentum
- smoothness
- group focus.

■ Withitness

With 'withitness', Kounin (1970) referred to the ability of the teacher to be aware of what is going on in the classroom, 'withit', being perceptually and cognitively alert and aware of all aspects of their classrooms at all times (Kounin 1970; Notar & Sorbet 2020). By being acutely aware of all the dynamics playing out in the classroom, the teacher can better inhibit poor student behaviour, and can ensure better involvement in the learning activity. In the physical classroom, withitness would mean that the teacher's nonverbal communication would send out signals to the students, often ensuring a more conducive learning environment. One aspect of withitness is monitoring (Notar & Sorbet 2020). Students' body language and facial expressions often tell the facilitator whether they are actively involved or bored or confused.

A hallmark of the face-to-face excursions over the years was teacher educators' 'withitness', and that they could 'think on their feet' and adapt the student excursion activities to better address students' needs, addressing any

problems or 'dramatical collisions' that occurred (as described in the previous paragraph).

It becomes trickier in an online environment with 250 students present, as most students' cameras are switched off. In this chapter, we will share our experiences over 13 virtual excursions in 2021.

The following section, 'The ripple effect', is based on the work of Notar and Sorbet (2020), related to factors that have a direct influence on withitness.

■ The ripple effect

The ripple effect refers to where the teacher corrects a behaviour or addresses a misconception that one student might hold, and this positively affects other students as well. In an online learning environment, an example of the ripple effect would be to redirect off-point discussions and ensure that students are clear about the learning task. As this was a synchronous event, the teacher educators as facilitators could direct any 'drifting off' in the discourse during the plenary sessions. Senior BEd students, in their 3rd and 4th year, were trained as student facilitators to scaffold learning during discussions in the break-away groups, and these student facilitators ensured that students stayed on track during the group discussions (cf. ch. 4).

■ Overlapping

Notar and Sorbet (2020) describe 'overlapping', another tenet of Kounin, as attending to two or more events at the same time. A classic example of such overlapping in the online virtual learning environment is being able to read students' feedback or comments in the 'chat box' on the Zoom platform whilst engaging in the facilitation of a learning activity. In this regard, the withitness of the technical ICT team was of great value as they were able to point out the most compelling remarks to us as facilitators for further discussion.

■ Momentum

Conley and Du Plessis (2015) describe momentum as the teacher's ability to move steadily through a lesson or pace a lesson evenly. After the first few virtual excursions, the facilitators made changes to the excursion programme to ensure maximum student involvement and good momentum.

■ Smoothness, transition, and group focus

Smoothness refers to the transition between learning activities. Conley and Du Plessis (2015) explain that it means maintaining direction in the lesson without losing focus. According to Kounin, smooth and effective transitions

are very important in maintaining student involvement and class control between different tasks in a lesson. The teachers should not be distracted, and they must know at all times what is happening. Thorough planning preceded the excursions, and a learner guide with the programme was provided to the students.

Group focus

Kounin (1970) also identified group focus as being of importance. Group focus refers to getting every student involved and focused on the learning outcomes. Games are one way to secure group focus, and this has been successfully applied in virtual excursions (cf. ch. 9 on gamification). To ensure group focus, the educator facilitators continuously referred back to the video diary of the principal played at the beginning of the excursion. The video diary screen played an ill-structured problem and was also the golden thread or driver for all individual activities that took place.

Notar and Sorbet also refer to satiation, and Sipman et al. (2019) flag the relevance of pedagogical tact in this context. For this reason, these two constructs are also discussed.

Satiation

Satiation, meaning being satisfied or having enough, is also of importance in the context of the virtual excursion (Notar & Sorbet 2020). It is important to satisfy students' needs and keep them engaged, arresting the progressive loss of interest that students might show as the learning activity unfolds. The experience in online learning platforms is that saturation sets in, which results in students being online but not actively engaging in the discussions. It is therefore important to offer the students challenges throughout the virtual excursion, and one way we attempted to do this was through regular opinion polls or students making comments in the chat box on the Zoom platform.

Pedagogical tact

Sipman et al. (2019:1187) speak of pedagogical tact as 'the artistic ability of teachers to instantly act upon the complexity of classroom situations'. Pedagogical tact is built on the work of Van Manen (2015) and encompasses the notion that 'handling complex classroom situations requires receiving, perceiving, feeling, and judging, as well as letting go of routines and being freed from the influence of habit'. However, this is a very elusive, intangible construct, and Muth (1962) spoke of the '*unverfűgbarkeit*' [unavailability] of the construct. The latter researcher claims that pedagogical tact is expressed through teachers' situational confidence, dramaturgical capability, improvisation, and spontaneity. Van der Wolf and Van Beukering (2011) explain

that pedagogical tact is about 'reading the situation'. Such pedagogical tact is of crucial importance in such a virtual online learning environment. The teacher educators as facilitators realised during the first virtual excursion that an inviting learning space should be created where the two main facilitators have an informal discussion, based on the students' feedback, and that elements of dramatising could be effectively used. The findings show that this goal has been achieved.

◼ Withitness and the Community of Inquiry framework

In online environments, the interaction between students is very important for student success. The Community of Inquiry framework for online learning environments, as proposed by Fiock (2020), builds on the work of Garrison et al. (2000). According to Fiock (2020), three core elements – cognitive presence, social presence, and teaching presence – jointly create meaningful online learning experiences. Before we show how this links to the Kounin model of withitness, definitions of these constructs will be given.

Byun and Cardenas (2013) describe online presence as:

> [7]he degree to which a person is perceived as real in mediated communication. The projection of one's personality, the sense of being together, and the degree to which a person is perceived as a real person in mediated communication, are the main components of online presence. (p. 2)

Cognitive presence refers to the ability to construct meaning through sustained reflection (Fiock 2020:136). Garrison et al. (2020) advocate the practical inquiry model to support cognitive presence. The practical inquiry model includes four phases, namely, (1) a trigger event or a problem posed, (2) exploration, where students investigate the issue, (3) integration, where students construct meaning, and (4) resolution, where students apply the newly acquired knowledge and skills.

Fiock (2020:137) describes social presence as 'a theory that explains the ability of people to present themselves as real people through a communication medium'. Garrison et al. (2000) identified three indicators for social presence, namely, (1) affective expression, where students can share personal beliefs of values, (2) open communication, and (3) group cohesion. Teaching presence is described by Fiock (2020:137) as 'the design, facilitation, and direction of cognitive and social processes to support learning'.

The elements of cognitive, social, and teaching presence were deliberate design elements when the virtual excursion was developed. For example, the four phases of the practical inquiry model were:

1. Students were shown a video to provide context for the excursion programme. In the video – a video diary of the newly appointed principal at

a dysfunctional school – the students were confronted with an ill-structured problem that they needed to solve.

2. During the exploration phase, which happened in small-group break-away rooms, students – in CL fashion – identified the problems and discussed possible solutions to the problem.

3. During the integration phase, the students used theory to interrogate practice and had to come up with a management plan to address the problems in the school.

4. During the resolution phase, students reflected on their learning process and identified learning goals for their own professional development (as self-directed learners).

In order to create a learning space in which students would experience 'real' people engaging with the complexities of the teaching profession, the two main facilitators (two of the authors of this chapter) entered into informal dialogue with each other when responding to students' feedback. It sometimes meant an openness in admitting to mistakes that we have made as novice teachers – an aspect that the students responded positively towards.

Withitness also encompasses an acute awareness of ensuring cognitive presence, social presence and teaching presence in the virtual online learning space.

◼ Methodology

As explained earlier, both 'withitness' and pedagogical tact are elusive constructs and difficult to measure. However, it is a safe assumption that withitness would manifest in successful online learning opportunities, where the facilitators excel in 'reading the situation' and respond to any issues that might arise in the teaching-learning context. This mixed methods research draws on quantitative data obtained through the online opinion polls and qualitative data obtained through open-ended questionnaires that students completed after the excursions, as well as reflections by the teacher educators.

In this chapter, we analyse the feedback provided by student-teachers (*n* = 1069) on their experiences, and we furthermore draw on the reflections of the teacher educators (facilitators) (*n* = 4) who engaged in the synchronous virtual excursions. We have made use of *a priori* codes, where codes were developed before the analysis of the data. Such *a priori* coding is used where 'certain issues in relation to the topic being researched is so well-established that one can safely expect them to arise in the data' (University of Huddersfield n.d.:n.p.). Based on the interpretation of Notar and Sorbet (2020) of withiness in an online virtual learning space, we have established *a priori* codes such as withitness, the ripple effect, overlapping, transition, satiation, and pedagogical tact. We have utilised the technique described by King et al. (2005), where these *a priori* codes were used as headings for columns in a matrix.

Responses in the open-ended questionnaire and reflections by teacher educators were transcribed, and sections of these transcribed responses were entered in specific cells in the matrix under the appropriate codes. This analysis then resulted in the identification of a number of emerging themes.

This is a nascent research, and we acknowledge that this coding technique could result in important other themes being overlooked (University of Huddersfield n.d.). The themes discussed in this chapter are therefore tentative themes. Both quantitative and qualitative data are drawn upon, in the discussion of the emerging themes. Ethical aspects related to the research were discussed in Chapter 2.

■ Theme 1: Increased student satisfaction as a result of 'withitness' of facilitators was experienced as the excursions progressed

Both the quantitative (opinion polls) and qualitative data (feedback in chat boxes on the Zoom platform, as well as responses to open-ended questionnaire) showed that students rated the excursion very positively. There was furthermore an improvement in the ratings as the excursions progressed. In Figure 11.1 (a–c), this progression is shown: whereas 80.4% of students rated the first excursion (A) as 8, 9, or 10 (with 1 meaning very poor and 10 excellent), the figure rose to 87.3% in terms of students who scored the second excursion (Excursion B) as 8–10, and by Excursion I, the figure (of 8–10 ratings) grew to 89.5%. Although there are several variables at play, one of the possible reasons for this increase in student satisfaction with the excursion is the 'withitness' of the facilitators, who constantly reflected on how the online learning of students could be enhanced. For instance, it was realised during Excursion A that a 4-h session is simply too long for students to keep focus, so a midway break was introduced and the session shortened by 30 minutes. The feedback from students clearly speaks of the withitness of the facilitators.

Student comments on the virtual excursion also clearly speak of the withitness of the staff. The six subthemes are as follows.

□ Subtheme 1.1: Students acknowledge that the virtual excursion was an empowering learning opportunity

The facilitators were surprised by the overwhelming positive feedback by students on the excursion. (Feedback for these face-to-screen events was much more positive and evident of deep reflections than the feedback received in the past on the face-to-face excursions). The high level of student satisfaction is proof that the facilitators were flexible enough to 'read the situation' and respond to emerging student needs. Students' experiences are critical, as they are ultimately the *raison d'être* ('reason for being' or 'reason
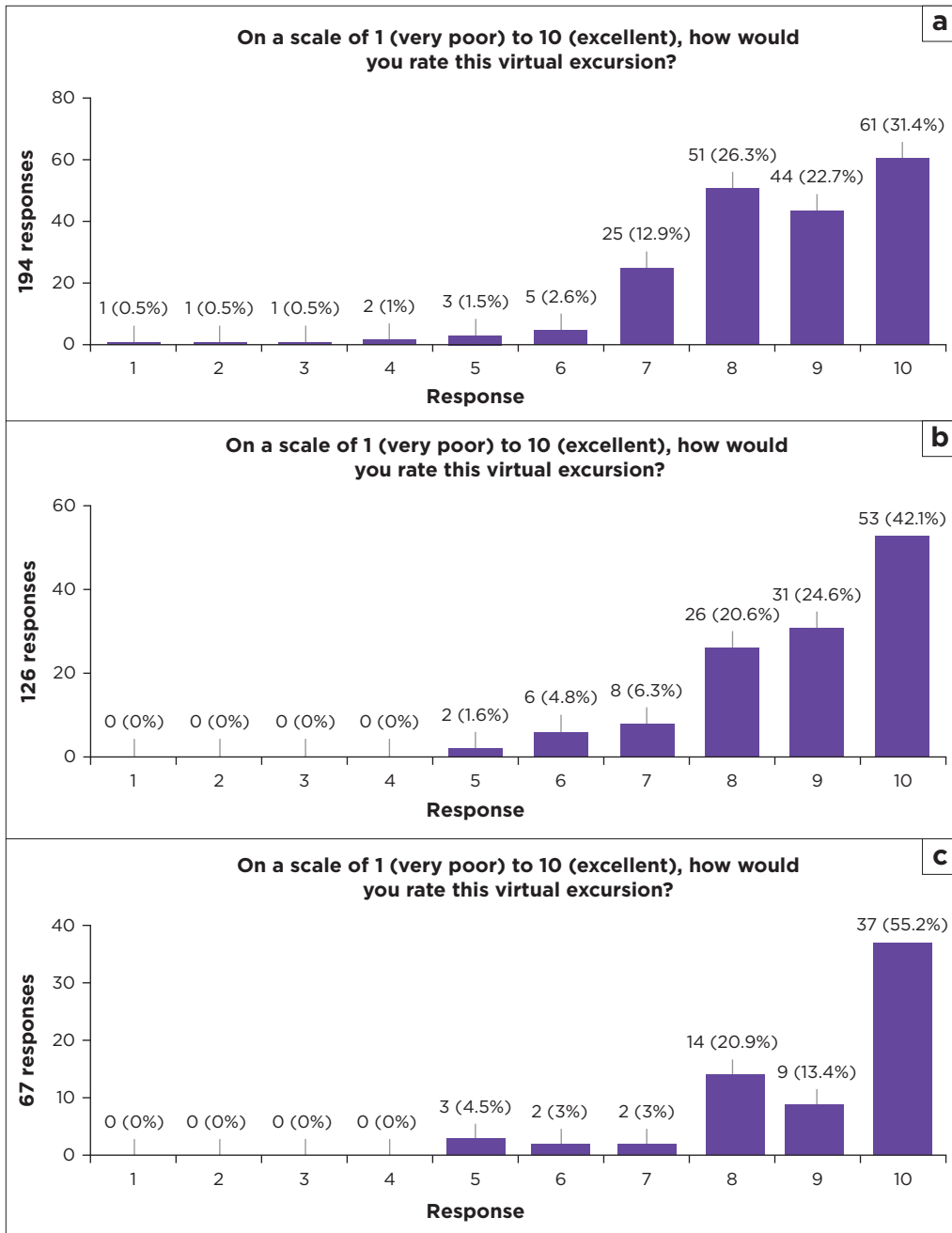
FIGURE 11.1: Gradual improvement in students' satisfaction with the virtual excursions: (a) ratings of students who attended Excursion A, (b) ratings of students who attended Excursion B and (c) ratings by students who attended Excursion 1.

to be') of the educational endeavour (Van Wart et al. 2020). Here are some of the student responses:

'This was a great experience. I am so glad that I could participate because I learned a lot.' (BEd student, female, 15 October 2021)

'It was extremely exciting, I have never thought this was possible, but it was amazing — I learnt a lot.' (BEd student, unknown gender, 15 October 2021)

'I thought that I could already walk into a classroom and start to teach children. I didn't know I still had so much to learn! I also learnt that children don't have the same needs in every school, and you should take that into consideration when you teach. You must also be innovative and find interesting ways to teach children in your specific subject.' (BEd student, female, 15 October 2021)

'The virtual excursion was a life-changing excursion I would say, I learnt more about the teacher I am becoming. As much as I wished and prayed that it could have been a face-to-face excursion, I enjoyed every little bit of the excursion. It was indeed not a time-waster and I so wish that whatever I learnt from the excursion happens around me so that I can be a super teacher with super solutions.' (BEd student, female, 15 October 2021)

'My overall experience, I would say it was intriguing, because it showed me that there is more to a teacher than what I thought. I now know that a teacher is not only the person who just write on the chalkboard and explains but rather the person that goes an extra mile in order to ensure the success of the learners. The excursion was an eye-opener and it really made the love of teaching to really escalate and to be eager than never before.' (BEd student, unknown gender, 15 October 2021)

The data were overwhelmingly positive in terms of being a positive learning environment. However, there were a few negative responses as well, mostly related to technical issues negatively impacting on learning:

'Being placed in group was very demanding and makes it hard to concentrate worrying about connectivity, or group dynamics.' (BEd student, gender unknown, 15 October 2021)

The next subtheme very strongly links to withitness as it refers to the students' experiences of engaging with the facilitators.

☐ Subtheme 1.2: Students valued the virtual presence of the facilitators (professors)

The 'withitness' of the facilitators should also manifest in a strong online presence.

The students responded well to the informal, friendly and inviting learning space that was created by the facilitators. The facilitators' pedagogical tact was expressed through situational confidence, dramaturgical capability, improvisation, and spontaneity. Where appropriate, we also shared our own experiences, including the mistakes we made as teachers, in an honest way with the students. We sometimes had to think on our feet and even conducted 'magic tricks' (demonstrations, which will be referred to later in this chapter, in theme 5). Students felt that they were treated as 'equals' and that the professors were approachable. Here follows some feedback from the students:

'I really enjoyed the excursion. The professors were informative, clearly communicated all information and tasks, and were extremely kind. The excursion has taught me several valuable lessons that I am able to apply to my teaching career one day.' (BEd student, unknown gender, 15 October 2021)

'I enjoyed the professors. They had a good sense of humour and communicated with us all in a manner which made us feel like their equals.' (BEd student, female, 15 October 2021)

'The feedback aspect. When the professors discussed group's feedback, they also gave more examples and real-life experiences. It was really insightful, and I learned more from it than in a textbook. I also enjoyed it when the professors demonstrated their points, which helped me learn better.' (BEd student, gender unknown, 15 October 2021)

'I have learned a lot more than I thought I knew about teaching. I found it very interesting and engaging. Although it was four hours a day, the professors kept it interesting, and I enjoyed meeting new people in my group and breakroom. Overall, it was a fun and new experience that I will never forget and am proud to be a part of.' (BEd student, gender unknown, 15 October 2021)

'Watching the two professors talking and explaining what the excursion was all about and … also making the poster, were highlights.' (BEd student, male, 15 October 2021)

'The professors' presentations were fun and interesting, and I am very happy to have attended the online excursion regardless of the unfortunate circumstances for which a virtual excursion is required.' (BEd student, gender unknown, 15 October 2021)

'Communicating with professors, they made me feel comfortable. They were not judgemental. They took every reasoning of students' responses.' (BEd student, gender unknown, 15 October 2021)

☐ Subtheme 1.3: The group work in the break-away rooms was perceived as a good design principle for such excursions and aided cognitive presence

As mentioned, withitness also means a sensitivity towards establishing a cognitive presence in the virtual online environment. Having followed the practical inquiry model of Anderson et al. (2001), CL – in the break-away rooms – offered an effective platform for the exploration and integration phases (cf. ch. 8 on students' experiences about CL). Students responded very positively in terms of establishing this:

'I loved the group work. You get to know different people and it was fun to work together and find solutions.' (BEd student, gender unknown, 15 October 2021)

'I had a lovely time, and I really enjoyed the experience to learn what I can do to become a super-teacher and learn how to work in a group.' (BEd student, gender unknown, 15 October 2021)

'I enjoyed being given the opportunity to discuss the content being presented in the breakout rooms with my group. I feel this was a great help when I may have misunderstood something and needed an extra hand. The discussions with my group helped me fully grasp the content.' (BEd student, unknown gender, 15 October 2021)

'The virtual excursion enabled good teamwork and cooperative learning by effectively working with students who are ahead in their years of study. It was a great exposure to work and share ideas with others.' (BEd student, unknown gender, 15 October 2021)

'I truly enjoyed all the lessons. It was an eye-opener, showing the importance of teamwork as at times you might think you are right, however when you hear what others are saying about the same topic, you then realise that never conclude on a matter until you have heard others people's opinion, and as a teacher it is very important to learn from others as well. Empower yourself as for help when needed and always plan ahead, love what you do, and have an educative spirit.' (BEd student, female, 15 October 2021)

The majority of the responses received were positive and indicated that the students experienced CL or groupwork as positive. There were a few negative responses as well, for example:

'Some people never participated in the group.' (BEd student, unknown gender, 15 October 2021)

☐ Subtheme 1.4: The fact that the facilitators built the virtual excursion around an ill-structured problem was perceived as enhancing the learning experience and addressing cognitive presence

Anderson et al. (2001) state that step 1 in the practical inquiry model should be a 'triggering event', where a problem is identified for further inquiry. The fact that the virtual excursion built on such an ill-structured problem (the video diary of the principal, highlighting the problems in a dysfunctional school), set the stage for critical thinking, reflection and affective engagement. The programme was purposefully planned to allow the students more time to reflect after the first day and beginning of the following day's excursion. We believe that this design added value because it gave the students more chance to internalise the content of the activities. This is supported by the feedback from a teacher educator:

'A strong point of the virtual excursion is that students had time to reflect on the activities. They had to think about the personal message that emerged for them from each of the learning activities.' (Teacher Educator, male, 20 October 2021)

Students reflected in a positive light on this design feature:

'I enjoyed the whole camp, but the part that stood out the most was the video diary of the principal. It got me to personally think about my future as a teacher in a school and how I want to make a difference by giving practical, creative, and innovative solutions to problems faced in the schooling system.' (BEd student, female, 15 October 2021)

'The part I enjoyed the most was where we had to give answers to the proposed problems, I enjoyed that part because as soon as I answered I would get immediate feedback which made me see if there are an adjustment I need to make.' (BEd student, female, 15 October 2021)

'I enjoyed the part where we watched the video of the principal recording her daily diary. It really highlighted most problems that are being faced in South African schools. For example, some issues such as sexual relationships between teachers and students never come to light, so to see that it was highlighted, it was a very

heart-warming moment for me because a school needs to be a safe environment for both students and teachers.' (BEd student, female, 15 October 2021)

☐ Subtheme 1.5: Students appreciated the culturally diverse learning space that was created and the social presence experienced as united 'super-teachers'

The facilitators used the construct of a 'super-teacher' as the leitmotif underpinning the excursion proceedings. Student-teachers were encouraged to identify their own 'super-powers' as teachers, and this created an opportunity to engage with 'real people', each with their own strengths and growth opportunities, supporting social presence. It also provided an opportunity for reflection on one's own inclusivity and speaks about the resolution phase in the practical inquiry model. Students were encouraged that to know that should they find that they have certain prejudices or biases that might serve as barriers to be truly inclusive teachers, they could turn the prejudices into personal developmental learning goals, a very important characteristic of a self-directed learner. Although the online learning environment did not provide the same affordances in terms of establishing contexts for 'dramatical collisions', students did respond positively in terms of working in a culturally diverse learning environment. Here are what students had to say:

'I experienced to work with other people from different cultures and I enjoyed it.' (BEd student, female, 15 October 2021)

'I have enjoyed it a lot because I was with white people who speaks English very well, so I learned a lot from them.' (BEd student, male, 15 October 2021)

'It was great communicating with different people from different campuses and being able to interact with them.' (BEd student, female, 15 October 2021)

'Meeting new people with the same passions and of course being among the first students to experience the excursion in this manner.' (BEd student, unknown gender, 15 October 2021)

One negative comment in this regard was:

'The group that I was assigned to the day before the excursion was problematic. The members did not participate in group discussions during the excursion and relied on me to do everything that had to be done.' (BEd student, unknown gender, 15 October 2021)

☐ Subtheme 1.6: Gamification added to student enjoyment and satisfaction and also provided students with more nuanced understandings of online learning programmes

Garrison et al. (2000) highlight the importance of instructional design to support cognitive and social presence, and gamification proved to be an

excellent design feature for such virtual excursions (gamification is discussed in ch. 9). Students experienced the 'Famine and Abundance' game as fun but meaningful, because they learned and realised that they might have students from all socio-economic backgrounds in their future classrooms. Students commented on the gamification aspects as such:

> 'The game we played was something new for me and it was fun, and while we were having fun, we still learned a lot.' (BEd student, female, 15 October 2021)

> 'Being allocated a country and money, to see how privileged and unprivileged some learners will be in class, was a highlight for me.' (BEd student, female, 15 October 2021)

> 'I learnt how to use platforms like Zoom and I generally enjoyed it.' (BEd student, gender unknown, 15 October 2021)

■ Theme 2: Smooth transition in the virtual excursion programme resulted in student satisfaction

In Figure 11.2, the aspects that the students experienced as highlights of the virtual excursion are shown. The interaction with other students (18.24%) was rated the highest, which should probably also be seen in the light of the possible experiences of isolation that the COVID-19 pandemic has brought. A further 16.84% of students highlighted group work (CL) as a highlight, followed by 12.91% for videos. When the excursion programme was conceptualised, only a few videos were included in the programme. However, the 'withitness' of the facilitators made them realise that more videos should be included. Short videos were produced to better contextualise the different learning activities. A peculiar highlight mentioned is 'dancing' (2.81%). During the first excursion, the facilitators realised that two 4-h sessions are very long periods for students to concentrate. The facilitators therefore decided to use music videos as an illustration of how multiple intelligences could be addressed in the classroom. A video was made on polymerase chain reaction by Bio-Rad laboratories, a technique related to DNA technology, based on the popular song of the 1980s by the Village People, 'YMCA'. The GTCA song is based on the four base molecules comprising DNA, namely guanine, thymine, cytosine, and adenine. Some of the students participating in the virtual excursions opened their cameras and started dancing to this upbeat music video, and that snowballed and created an almost electric atmosphere. It showed how active participation and affective outcomes can be achieved, even in virtual online environments (see Figure 11.3).

Another example of smooth transition is the constant reminder that the focus of the virtual excursion is to find answers to the 'ill-structured problem', and that these solutions should be provided in the artefacts (e-posters) that students reproduce (cf. ch. 10).
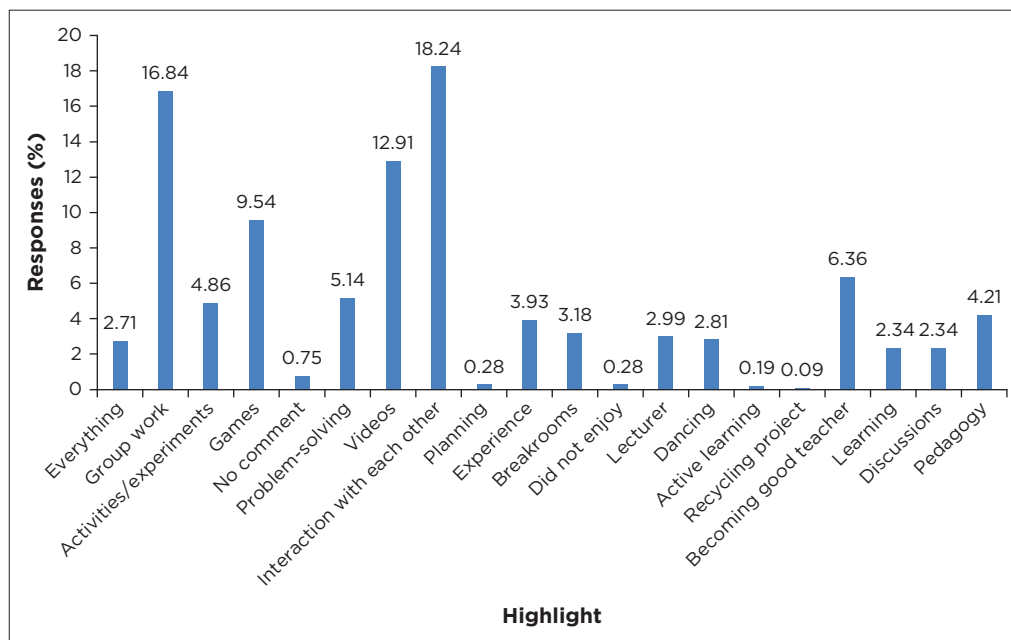
FIGURE 11.2: What students perceived as highlights during the virtual excursion.

Source: Screenshot taken during virtual excursion, published with permission from Ian du Plessis (No Beat No Music) and consent provided by students.

FIGURE 11.3: Evidence of student engagement: Screenshot showing students dancing to the GTCA song during the virtual excursion.

Students also took initiative to ensure good transitions. One of the teacher educators reflected as follows after attending one of the excursions:

'Typical of the millennials, the students quickly created WhatsApp groups and befriend each other, and this provided a preferred means of communication for the assessment task (developing e-posters) that students had to do.' (Experienced teacher educator, female, October 2021)

'"Withitness" of the facilitators was also highlighted in the fact that 2.99% of students indicated 'lecturers' as a highlight of the excursion.' (Teacher educator, male, October 2021)

One of the students commented as such:

'I also loved the part where we danced to the enzyme's song about guanine, cytosine, adenine, and thymine; it gave me a teaching strategy or style on how to make my teaching fun and interactive for my learners to enjoy in class instead of the old-fashioned teaching of the teacher teaching and the learners only listening.' (BEd student, gender unknown, 15 October 2021)

■ Theme 3: Satiation and effectively ensuring student engagement and interest through innovation

In order to keep the students interested and involved throughout, students were involved in opinion polls throughout the programme, and they were also constantly encouraged to engage with each other in the chat box function on Zoom. Figure 11.4 provides such a discussion strand.

The informal discourse and approachability of the teacher educators was listed as one of the ways of ensuring student involvement and interest:

'I noted a significant emphasis on supportive and inclusive approaches to make everyone (students and facilitators) feel at ease and welcome. A light and enthusiastic approach was used, even to convey learning or discussions on "heavy" or challenging issues. The structured interaction between students and facilitators was a strong point.' (Teacher educator, female, 12 October 2021)

■ Theme 4: Ripple effect – utilising tools such as Google Forms

In order to ensure that students focus on the task at hand and do not let disruptions or irritations distract them from the learning task, students were constantly reminded to communicate concerns or problems to the facilitators through the use of Google Forms. All students, thanks to a generous UCDG grant provided by DHET, received 10 GB of data to participate in the virtual excursions, and this was managed by the faculty's administration. However, given the large number (2500) of students who participated in the excursion and that students often change cell phone numbers, there were students who did not receive their data on time. Also, some students in more rural areas in
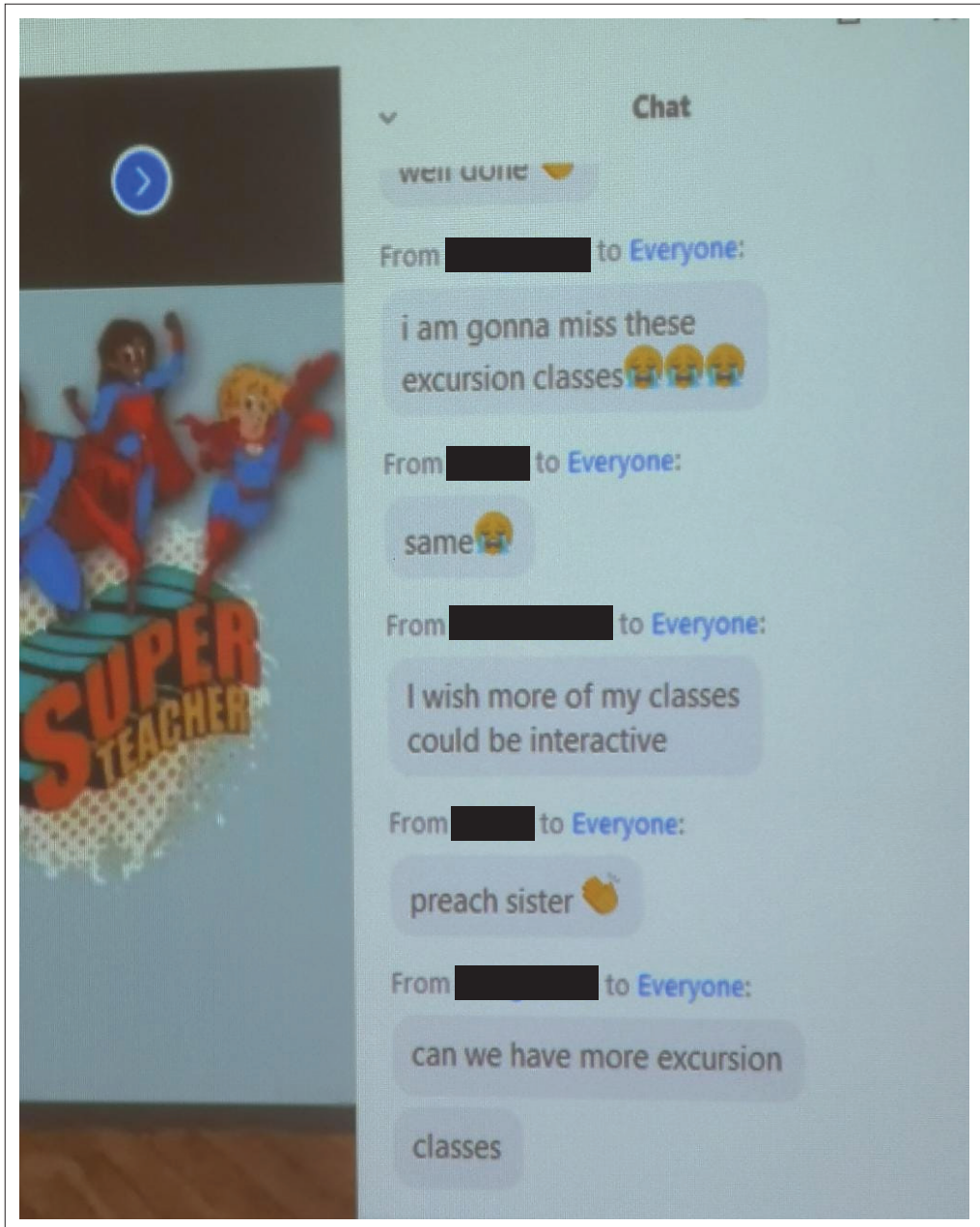
Source: Screenshot taken during virtual excursion, published with permission from Ian du Plessis (No Beat No Music) and consent provided by students.

FIGURE 11.4: Students' discussions in the chat function of Zoom, illustrating their appreciation for the virtual excursions.

Source: Photograph taken by Josef de Beer in the Green Room, published with permission by Josef de Beer and adequate consent given by Prof. Neal Petersen.

FIGURE 11.5: A practical demonstration of pedagogical tact. When sharp pencils are pushed through a Ziplock bag filled with water, no water seeps out of the plastic bag.

the country struggled with connectivity issues – a factor that was intensified by load-shedding experienced during the duration of the excursions. In order to not let such negative aspects dominate the discussions, students were requested to indicate such problems on the Google Form, and the technical support team (a company, 'No Beat No Music') attempted to respond to such issues as quickly as possible. This avoided small irritations that would negatively impact teaching and learning.

■ Theme 5: Pedagogical tact ensured constant revision of the excursion programme

Despite the interactive nature of the virtual excursion, the facilitators also realised that short experiments and demonstrations could be useful to ensure maximum student engagement. The element of wonder should not be underestimated, because it can also address the affective domain of teaching, an aspect overlooked by so many teachers. The 'magic trick' of pushing sharp pencils through a water-filled Ziploc bag without any water flowing out was used to demonstrate the value of wonder in a lesson and also how such frugal (teaching-on-a-shoestring) approaches could be utilised to demonstrate phenomena such as refraction in the science classroom. This is an example of pedagogical tact of facilitators who have been involved in excursions with first-year students for many years.

■ Conclusion

When creating face-to-screen learning environments, there are a number of important factors that contribute to learning success and satisfaction. Foremost is that cognitive presence, social presence, and teaching presence should receive adequate attention during the design process. Social presence should also be seen as embracing elements such as 'perceived warmth, the feeling of human contact, sociability, and sensitivity towards the communication medium' (Munoz, Wang & Tham 2021:3). In this regard, the withithess of the facilitators is of prime importance. Our data show that a virtual, online learning event that builds on the Community of Inquiry framework, and where facilitators show withithess, could support effective learning and address affective outcomes. However, we have already commented on the restrictions of using *a priori* codes in a matrix style during data analysis (King et al. 2005), and we therefore introduce these themes as provisional, highlighting that this is a nascent research that should be strengthened during future virtual excursions.

Design principles for a virtual excursion for law students

René Koraan
School of Law Undergraduate Studies, School of Law,
Faculty of Law, North-West University,
Potchefstroom, South Africa

Getsia Zazo
Research Unit Law, Justice and Sustainability,
Faculty of Law, North-West University,
Mahikeng, South Africa

Ninette Crous
Manager of Student Affairs,
Faculty of Law, North-West University,
Potchefstroom, South Africa

Celia Lourens
School of Law,
Faculty of Law, North-West University,
Potchefstroom, South Africa

■ Abstract

First-year law students are already forming their own identities as legal professionals. The purpose of the excursion was to enable first-year law students to have a more nuanced understanding of the legal profession and

to instil in them a variety of skills relevant and necessary for practice. In planning this virtual excursion, the challenge was to design an online learning environment in line with these outcomes. This nascent research provides a conceptual research framework on virtual excursions and the design principles which should be considered for such excursions. The sessions were planned to the overarching theme of social justice and diversity, which we consider important for practitioners in the law profession. The ice-breaker session exposed students to a factual scenario that required SDL. Students worked in groups, with special emphasis on student-centred, problem-based, and CL. Interactive sessions were presented on effective communication and ethics, as it is integral to the legal profession. These were further supported by sessions in which law students engaged with legal practitioners. The Hunger Games (which the Faculty of Education calls the 'Famine and Abundance' game; cf. ch. 9) made students cognisant of the social injustices within different communities and the impact of such on individuals. From the gender theory workshop, students were able to understand the intricacies of gender. The sessions on leadership provided students with the opportunity to identify personal leadership qualities and to reflect on how this relates to their identities as future law practitioners. One of the goals of the excursion was to develop each student's ability to interact and collaborate effectively with others and to work as part of a team. Most of them will in their professional lives have to work within communities of practice.

■ Introduction

The NWU Faculty of Law has three sites of delivery: Mahikeng, Potchefstroom, and Vanderbijlpark (NWU n.d.). The Faculty of Law held yearly face-to-face excursions for first-year students successfully since 2019, following the example of the Faculty of Education. In 2021, because of the global pandemic, the Faculty of Law collaborated with two other faculties within the university in the initial planning stages of what would be its first virtual excursion. Whilst the common overarching goal remained to foster students' SDL and to provide students with better understandings of the complexity of the respective professions they chose, each faculty had to come up with its own specific set of aims and goals to be accomplished with regard to its cohort (cf. ch. 2). This was a welcome challenge as a substantial body of research literature shows that environments that support the use of technology could effectively nurture SDL (Mentz & Bailey 2019:237).

In this chapter, the planning of this excursion will be explained, with emphasis on the migration from a traditional face-to-face excursion to a virtual event. A conceptual research framework on virtual excursions and the principles underpinning it will be illuminated, as well as how the aims and goals were executed through the sessions during the excursion.

Furthermore, this chapter recognises that an excursion presents an opportunity to harness essential skills students need in order to be successful, not only in their studies but also in the legal profession. With proper planning, it bears the prospect of enhancing the university experience and performance of the individual students (Slough & Bormann 2011:59).

■ Background: Migrating to a virtual excursion

When planning a face-to-face excursion, it is relatively easy to predict the type of attendance and interaction you will receive from students or at least to plan for different methods of ensuring attendance and interaction. Bosch and Laubscher (2020:125–126) highlight a few considerations when planning educational interventions, which include the aims and objectives, the content, and where students are involved, their feedback.

■ The planning phase

To ensure that a virtual excursion maintains the affective dimensions (the feeling of excitement that students experience during face-to-face excursions), the planning of the excursion had to consider how such emotional engagement could be achieved. Videos and gamification elements have to be used, and this could be challenging to facilitators who find it difficult to work with technology.

■ Technical aspects

To make the hosting of a virtual excursion practically possible, it is preferable for a service provider to be appointed and for reliable audio-visual equipment to be secured. Because of the extent of the project, with around 300 law students across the three NWU campuses participating, a particular service provider with the necessary skills had to be appointed. The service provider had to assist in creating a virtual learning space that was as close to reality as could be, and they had to ensure that the planned excursion run smoothly, with all technical aspects covered. The online platform needed to be user-friendly because the success of the online excursion is largely dependent on students' skills and experience with technology (Bosch & Laubscher 2020:143).

■ Facilitators

In contrast to a face-to-face excursion where the facilitators or instructors can control the environment, the service provider played a vital role to ensure that the events of the online excursion were able to run smoothly in the virtual setting. Facilitators also had to understand the principles of problem-based and CL in a virtual online learning space.

The challenges with hosting a virtual excursion certainly seem daunting. Students are no longer able to engage with each other face-to-face or get to know each other as they would have in a face-to-face environment. Facilitators are no longer able to get to know multiple students and engage with them on a more individual level. Walther writes that email and computer conferencing can reduce interpersonal effects and group solidarity (Walther 1996:5). Sessions that normally would have led to positive feedback and active engagement now have to be redefined and restructured. The hosting of a virtual excursion can therefore almost seem impersonal. Kiesler writes that in an electronic environment, the sender of a message is not able to alter the mood in which they send the message and that they cannot impart any charisma in their message (Kiesler 1986:48).

Where face-to-face excursions allow for facilitators, who act as instructors, to actively engage with students and to visually present the activities, an online environment requires a different form of facilitation. Facilitators are very necessary for situations where a large group of students needs to be monitored (Bosch & Laubscher 2020:131). Facilitators with good communication skills are a vital component because they should be able to keep the conversation going. Essentially, the facilitator should only act as a guide and the activities should be student-centred (Mentz & Bailey 2019:236). It was also important to make sure that the facilitators received the correct training so that they could contribute to the aims and goals of the faculty of the law online excursion.

◼ Ensuring that students attend and participate

Perhaps the most challenging part of a virtual excursion is ensuring that students attend the online excursion. Their attendance can be influenced by various aspects which will be discussed below.

☐ Deciding between voluntary and mandatory attendance

In an online environment, the eagerness to participate can somewhat disappear, in contrast with the affective buy-in characterising face-to-face excursions. Students may realise that it will be a good learning opportunity to attend the online excursion, but once they join the online platform their eagerness can quickly disappear. They are in their home environment and are not necessarily only focused only on the excursion. According to Peper et al. (2021:50–51), students can experience distractions during online classes, and this should be taken into consideration when planning so that activities can be planned to enhance student engagement. Making an online excursion mandatory can place a sense of responsibility on students and discourage them from taking the excursion for granted.

☐ Provision of data bundles

Whilst a face-to-face excursion asks students to take time out of their schedules to attend an event, a virtual excursion requires something different from them. Students need access to electronic devices that require data connectivity in order for them to join or participate in the excursion. The issue of access to data can be resolved by organisers by providing each student with a portion of data bundles that would be enough to allow them to join the online excursion.

☐ Promoting group discussions within break-away rooms

The success of the online excursion is also dependant on students interacting with each other and with the facilitators. Keegan (1986:89) writes that students should always have an opportunity to engage in discussions with instructors and other students. Whilst some people feel more comfortable engaging in discussions during face-to-face excursions, interaction with students during an online excursion is also necessary. McConnell (2013:2) is of the opinion that through discussing our thoughts, we become aware of not only our own learning but also that of others. In order to achieve the aims and goals of the online excursion, interactions with students are important. Ozkara and Cakir (2018:924–925) write that just because there exists a possibility for interaction in an online environment, it is not always guaranteed that students will communicate. Law students, on a first-year level, still need to learn how to work with other people in the legal field, how to work with clients that have a legal problem, and how to engage in group discussions regarding important legal aspects. Participating in group discussions can eventually bring about change in how people can do things (McConnell 2013:2).

In order to ensure this interaction between students and facilitators, as well as amongst students themselves, the use of smaller groups for discussion purposes was necessary. In this regard, the service provider played an important role. We decided upon break-away rooms on the online platform. It allowed students to be more comfortable and share their opinions with a smaller group of people. During face-to-face excursions, it is easy to divide students into smaller groups to discuss certain scenarios and for students to provide their opinion on certain problems. In a virtual setting, this can only be achieved by making use of break-away rooms. This function allows for students to still participate in discussions in smaller groups and give everyone a chance to voice their opinions. Such break-away room discussions should, however, be based on CL principles.

■ Method of investigation

Based on a conceptual framework, a review was done on PBL, SDL and CL. The research done by Knowles (1975:18) was used to distil a working definition of SDL.

Cooperative learning has become one of the dominant forms of instruction in the world (Johnson & Johnson 2009:365). It is seen as an 'instructional strategy that can enhance 21st-century skills' (Bosch & Laubscher 2020:119). Problem-based learning was originally developed around 1965 at the Faculty of Health Sciences of McMaster University and was influenced by the case study method developed at Harvard Law School in the 1920s (Schmidt 1993). The main purpose of PBL is to equip students with the knowledge suitable for problem-solving. Within the law, 'students are confronted with problems from life which they have to explain or analyse in terms of underlying legal principles' (Koraan 2017:107–108).

Defining self-directed learning

The enormous body of research available on the subject of SDL is proof that the concept is both relevant and well-researched. The most significant contribution comes from Knowles (1975), who introduced the idea that instead of simply 'educating people', it is more effective to 'help people learn'.

SDL is defined by Knowles (1975) as:

A process in which individuals take initiative, with or without the help of others, in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, choosing and implementing appropriate learning strategies, and evaluating learning outcomes. (p. 18)

Using this classic definition as a yardstick as suggested by De Beer (2019:116), it was therefore incumbent to ensure that students took ownership of their own learning by setting goals for themselves and thereafter evaluating the learning outcomes. Furthermore, presenters should ideally not simply come and speak 'to' students. There must be an element of engagement added to the presentations, such that in each session, students would not merely sit as 'passive listeners'.

Bosch, Laubsher, and Olivier (2020:81) compiled a list of SDL skills which students must possess or develop for SDL to be effective, as derived from the existing corpus of SDL. These include communication skills, critical thinking, discipline, dividing tasks, evaluating own performance, goal-setting, metacognitive awareness, organisation, planning, problem-solving, reflection, self-control, social skills, and time management.

Self-directed learning in the context of law students

In asserting the importance of fostering each law student's development towards SDL, Hamilton (2015:136) summarises five stages that must be preserved. The plan is to (Hamilton 2015):

1. Match the level of SDL required in educational activities to the stage of each student's current development regarding SDL.

2. Consistent with the first principle above, give the student more and more responsibility for their own learning as they develop greater capacities.
3. Integrate SDL with the student's acquisition of other competencies, such as knowledge of the doctrinal law and legal analysis.
4. Ask the students to practice SDL on tasks they will encounter in the practice of law in the future.
5. Present the urgent need for lifelong SDL in changing markets and emphasise self-assessment and reflection on progress towards later stages of development (pp. 136–137).

With this in mind, various sessions were included in the programme, including an ice-breaker which comprised a real-life legal problem that students could encounter in the future and on which students were tasked with conducting overnight research as part of the learning process. There were also break-away rooms strategically designed as part of some sessions where students could interact with one another and be guided by an appointed facilitator. Students would thereafter be able to report back to the main group on what they had discussed in the break-away rooms. Within the break-away rooms,
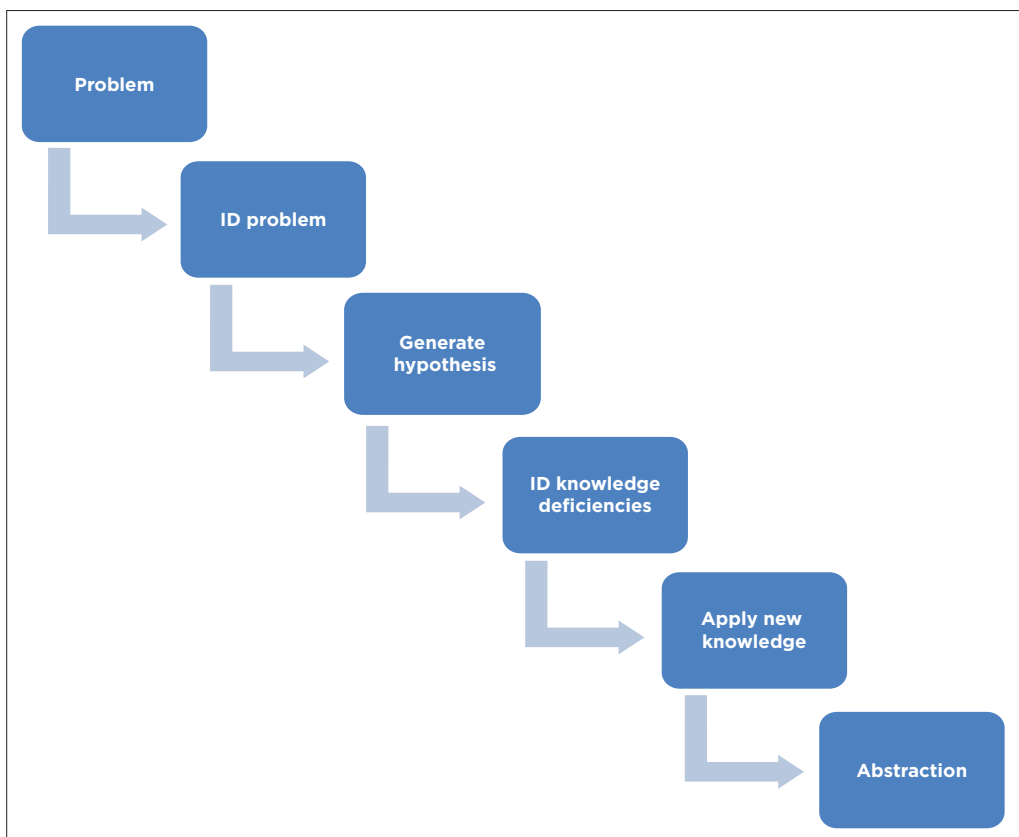
FIGURE 12.1: Problem-based learning cycle (Hmelo-Silver 2004:237).

facilitators made sure not to be loquacious but to allow students to freely take initiative and deliberate on the point of discussion. This way, students took more responsibility for their own learning.

■ Problem-based learning

With PBL, students are confronted with a real-life problem which they should first discuss, followed by the study of relevant sources (Schmidt 1993:427). Hmelo-Silver (2004:237) sets out different stages of learning to achieve effective PBL, which can best be demonstrated by a diagram designed by Hmelo-Silver.

Students are faced with an ill-structured problem and work in smaller collaborative groups to acquire the necessary knowledge to solve the problem (Hmelo-Silver 2004:237). Important to note is that the problem students are faced with relates to the knowledge they have already obtained, enabling them to identify the problem (Koraan 2017:107). After they have identified the problem, they can start to come up with possible solutions. The next step in the cycle will then be when students identify the lack of knowledge to solve the problem and do research to enable them to do so. It is during this stage that group discussions ignite prior knowledge activation, from which everyone in the group can learn even before new information is acquired (Schmidt 1993:427). Students will then, after their research, apply their new knowledge and evaluate their hypotheses. During the last stage, students will reflect on the knowledge they have gained through this process (Hmelo-Silver 2004:237).

Student-centred problem-based learning (SPBL) makes provision for additional steps to develop the students' skills of inquiry and research skills (Kurtz, Wylie & Gold 1990:802).

■ Student-centred problem-based learning

During SPBL, students reflect on their newly gained knowledge, their prior knowledge, their reasoning, and their problem-solving skills (Kurtz et al. 1990:801). An important part of SPBL is for the students to understand the problem, which is, according to Schmidt (1993:423), 'an important component of actual learning'. When dealing with a law student, this is especially important for the problem-solving process because of the legal terminology (Koraan 2017:108). Student-centred problem-based learning develops all skills necessary for problem-solving including inquiry and research skills. Similar to PBL, SPBL also consists of stages, which are (Kurtz et al. 1990:809–810):

> **(12)** Identification of the objectives of the session; (b) Interaction with the problem; (c) Identification of self-directed study questions raised by working with the problem; (d) Self-directed study; experience Application of acquired information to the problem; (f) Review and synthesis of what has been learned, and (g) Evaluation. (pp. 809–810)
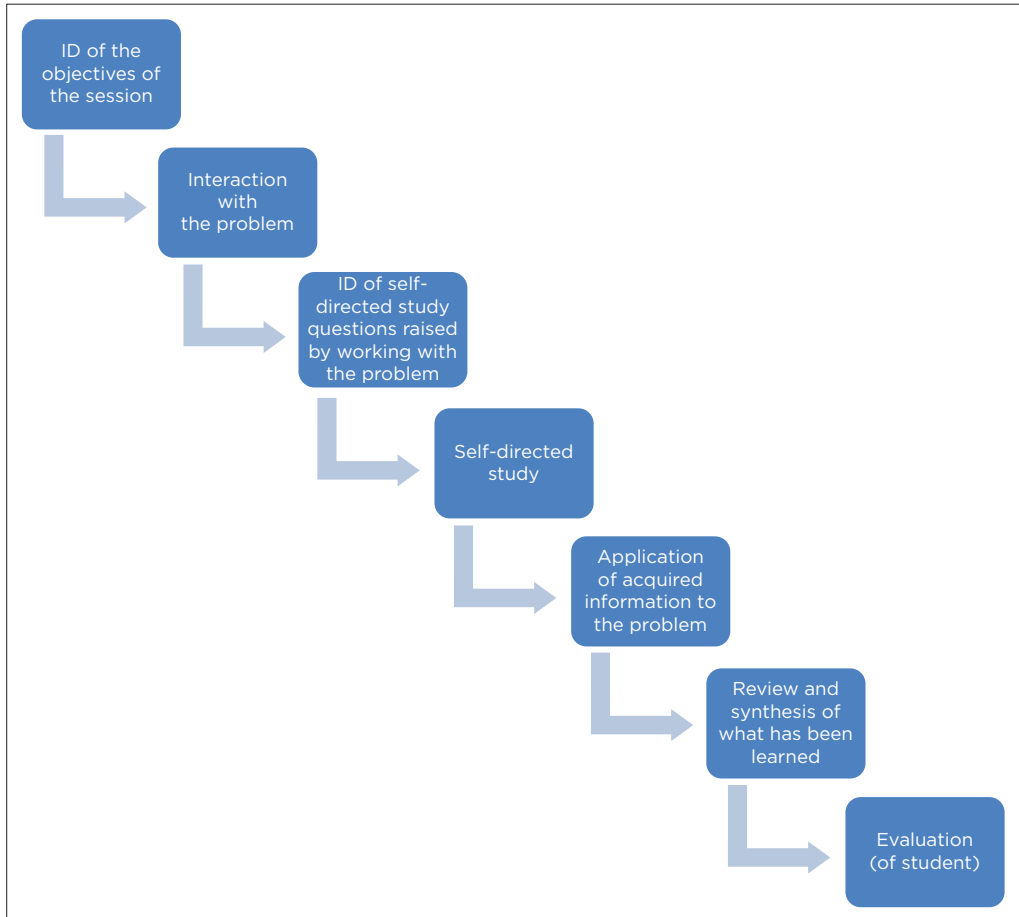
FIGURE 12.2: Student-centred problem-based learning process.

Similar to PBL, SPBL can best be demonstrated using a diagram (Koraan 2017:109).

It is evident that SPBL is a more intricate process with more stages (Kurtz et al. 1990:809–810). During SPBL, the lecturer takes on the role of facilitator. Great care should be taken by the lecturer to guide students during the SPBL process. Students should be able to confront the scenario or problem by asking questions that will enable them to get a complete picture of the problem. During this process, students only need their prior knowledge and experience as preparation. During the group discussions, students will then be in a position to share their experience and knowledge with other group members, even prior to gaining 'new knowledge' via research. Unlike a face-to-face engagement, virtual engagements should provide students the ability to engage in group discussions to ensure an effective SPBL experience.

Another stage, and probably the most important, is the evaluation stage. The lecturer must make sure that all the outcomes of the activity are met and achieved. Evaluation should not just focus on one (knowledge) specific skill to be achieved; otherwise, students will neglect the development of the other skills (Kurtz et al. 1990:812). During the virtual excursions of the Faculty of Law, the break-away rooms were key to the SPBL process. This is where students engaged with one another, and the evaluation was done during the feedback sessions.

■ Cooperative learning

Bosch, Mentz, and Reitsma (2019) defines CL as:

[*A*]n approach that involves a small group of students working together as a team to solve a problem, complete a task or accomplish a common goal. (p. 58)

According to Johnson and Johnson (2009), there are five basic elements to be adhered to for successful CL. These are:

[*P*]ositive interdependence, individual accountability, promotive face-to-face interaction, appropriate use of social skills and group processing. (p. 366)

Positive interdependence can be created by the assignment of different tasks to group members (Johnson & Johnson 2009:367). Members will then have a specific contribution to make which could create a sense of belonging. This can lead to members feeling responsible and motivated to complete their own tasks and facilitate the work of other group members (Johnson & Johnson 2009:368).

Accordingly, 'promotive interaction' occurs when members encourage and facilitate the other group members' work to achieve the goal of the group (Johnson & Johnson 2009:368). Students will thus be taking a leadership role in ensuring the task is completed or the goal achieved and, perhaps unknowingly, learn leadership skills. This resonates with Peterson's (1997:5) sentiments that a division of tasks will amount to 'role-playing'. This will defer responsibility on each group member who in turn will be more 'attentive to team maintenance issues'. This approach is important for effective leadership skills (Peterson 1997:5).

When using CL, the lecturer or teacher must take on the role of facilitator or the guide of instruction (Law 2011:402). The lecturer is no longer the source of information but will guide students on the information retrieved by themselves. This role should remain the same when using an online platform. The virtual excursion should be navigated in a way to ensure effective CL.

Yeh (2009) reported that:

[*O*]nline collaboration and learning communities may facilitate frequent interactive discussion and reflection, and therefore improve learners' critical-thinking skills, knowledge, and self-efficacy. (p. 188)

Laubscher et al. (2019:268) indicate, however, that several studies show the advantages of technology use, which in turn supports self-regulation. It is argued that the necessary merge to online teaching because of COVID-19 enhanced the design of technology to support effective CL and emphasised the paradigm shift referred to by Loncar, Barrett, and Liu (2014:93).

■ Aims and goals

Figure 12.3 presents a mind-map of the envisaged goals with this particular virtual excursion, and this guided the planning, particularly because the virtual platform was the first of its kind for the NWU Faculty of Law.

The identified aims of this excursion were to cultivate a sense of belonging amongst students; to assist them in developing a professional identity and obtain more nuanced understandings of their chosen professions; to get students to engage on matters of social justice and inclusion, whilst creating a safe space to enable interaction; and promoting SDL. This is essentially what lies at the heart of the virtual excursion planning process. In order to achieve these aims and goals, students learn and practice skills such as problem-solving, communication, leadership, and ethical behaviour during the sessions.

Each of these goals was considered equally important, and how specific inclusion of each goal within the programme was realised will be expounded upon. The challenge lies in achieving these aims and goals in a virtual excursion.
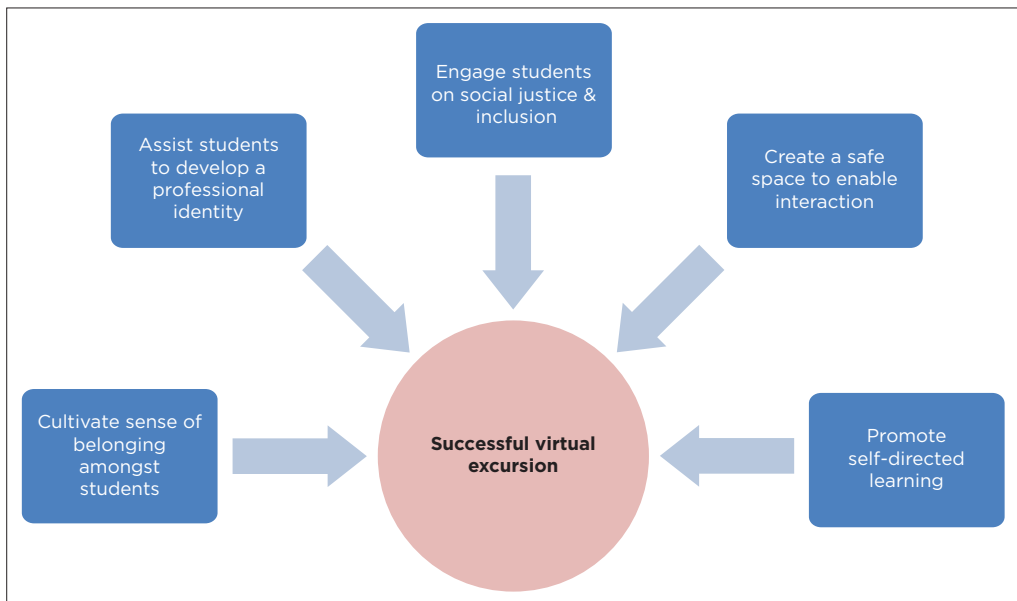
FIGURE 12.3: Planning the 2021 North-West University Law Faculty first-years' virtual excursion: Aims and goals.

■ Cultivating a sense of belonging amongst students

■ Three sites of delivery – One University

The excursion provides students with the opportunity to network with their fellow students from the three campuses and build a support system. The value of a sense of belonging is one of the five senses of the success framework, as developed by Lizzio (2011). A sense of belonging is defined by Goodenow (1993) as:

> [*B*]eing accepted, valued, included, and encouraged by others (teachers and peers) in the academic classroom and of feeling oneself be an important part of the life and activity of the class. More than simple perceived liking or warmth, it also involves support and respect for personal autonomy and the student as an individual. (p. 25)

Peacock et al. (2020:20) subscribe to this definition. A sense of belonging is important for the students to function and to have the necessary support system to assist, motivate, and encourage them to persevere in their studies (Jackson, Cashmore & Scott 2010:5; Peacock et al. 2020:21). The excursion provides a platform where students can learn more about their chosen institution, faculty, profession, and peers, as is evident by the sessions planned for the excursion.

According to the community of inquiry model, three criteria need to be met so that students feel a sense of belonging: 'cognitive, social, and lecturer presence' (Danaher et al. 2007), confirmed in Bakir and Phirangee (2021:386).

The virtual excursion aimed to create a sense of belonging amongst the students by using break-away rooms, the chat box, enabled microphones, emojis, and the leadership and ice-breaker sessions to ensure the 'cognitive and social presence' of the students.

■ Tools and sessions used to create a sense of belonging

□ Break-away rooms

Break-away rooms were used for the ice-breaker activity, ethics session, Hunger Games, and feedback sessions. Students were divided into smaller groups to interact with one another, and a facilitator was present in the break-away rooms to assist and facilitate the discussions. Break-away rooms allow students to engage with one another in a virtual space, similar to what group activities would do in a face-to-face excursion (Brown, Schroeder & Eaton 2016; Martin & Parker 2014:203). The break-away rooms further encourage active participation and the cognitive presence of the students (Brown et al. 2016). This allows students to interact with their peers in smaller groups.

The advantages of using break-away rooms include better student interaction and involvement in the topic, students having the opportunity to share their views and listen to the views of their peers, and an increased interest in the session.

☐ Chat box

The chat box was available during the entire excursion. The chat box serves as a method of active learning (Dengler 2008). Students were encouraged to make comments, share thoughts, and ask questions in the chat box. This occurred during and after presentations without interrupting the presenters. These questions not only assist in building a sense of belonging, but the questions asked benefit all the attendees, as everyone can see the questions and hear the answers (Martin & Parker 2014:194). This further builds critical thinking skills by considering the questions posed and answers received (Martin & Parker 2014:194). The purpose is for the facilitators and the hosts to constantly use the chat box to interact with the students, which in turn will lead to the students being more comfortable in expressing themselves.

☐ Enabling microphones

Students were able to actively participate in the main session by asking questions to the presenters and receiving immediate feedback. Enabling microphones was one of the tools used by presenters to connect with the attendees and build the community amongst students (Martin & Parker 2014:193). The enabled microphones assisted students to feel part of the session and ask questions directly to the presenter, interacting with the presenter as well as their peers in the main session.

☐ Emojis

Emojis have nonverbal communication functions (Bai et al. 2019:2). Emojis help students to communicate and the receiver to understand the emotion and attitude of the message (Bai et al. 2019:2; Lo 2008). Emojis improve the students' enjoyment (Bai et al. 2019:2; Chen & Sui 2017) and help them engage and interact with each other and the presenters (Bai et al. 2019:2). The use of emojis was seen as one of the contributing factors in student engagement and a sense of belonging in virtual classrooms or excursions (Martin & Parker 2014:93, 208). Students' understanding of the presenters and what was discussed increased when using emojis (Bai et al. 2019:11). Students were encouraged to use emojis to interact with one another during the sessions and to express how they felt about the information shared by the presenters.

☐ **Practical sessions as illustration**

☐ *Ice-breaker (student-centered problem-based learning)*

The ice-breaker activity, which is based on SPBL, took place over 2 days. The activity was based on an advertisement from Chicken Licken, which was the subject matter of litigation, and a final ruling was made by the Finals Appeals Committee of the Advertising Regulatory Board on 10 July 2019 (*Golden Fried Chicken (Pty) Ltd v Sandile Cele*). The content of the advertisement was based on reverse colonialism, and after watching the advertisement, the students were asked using a poll to express their initial feelings about the advertisement. The functions of the Advisory Regulatory Board (ARB) and the basis of the complaint and the defence were explained to the students.

The students received homework: to further investigate the ARB Code of Conduct Rules (ARB Code 2021) and to decide in whose favour the ruling was made. The subsequent morning started with students in the break-away rooms, where they discussed their opinions and provided feedback. After the students discussed their views and made their submissions, the facilitators explained the basis of the ruling. Students had an opportunity to express their views, listen to the views of their peers, and discuss whether they agreed or disagreed with the final decision. The ruling was that the advert did not include the negative effects of colonisation (e.g. the undeniable sufferings it brought) or any reference to them, thereby presenting it as something harmless (*Golden Fried Chicken (Pty) Ltd v Sandile Cele para 16* [ruling of the Finals Appeals Committee of the ARB of 10 July 2019]). This is insensitive and offensive to those who suffered under colonisation (*Golden Fried Chicken (Pty) Ltd v Sandile Cele* para 15 [ruling of the Final Appeals Committee of the ARB of 10 July 2019]). The complaint was upheld, and Chicken Licken was ordered to withdraw the television commercial in its current format with immediate effect, and the commercial may not be used again in its current format in the future (*Golden Fried Chicken (Pty) Ltd v Sandile Cele* para 18 [ruling of the Final Appeals Committee of the ARB of 10 July 2019]).

Students had an opportunity to further discuss the impact of the advertisement and whether using mockery as a tool to educate on important subject matters can be effective. Students were able to hear different views and respectfully engage with one another. The students held each other accountable for their contributions, and in this manner, evaluation could take place.

☐ *Leadership sessions*

The leadership sessions formed a cornerstone of the virtual excursion. The Law Society of South Africa's (LSSA) Legal Education and Development (LEAD) (n.d.) confirmed that leadership skills are part of the invaluable core

skills that legal practitioners should possess. Leadership is defined in the *Oxford Dictionary of English* (Stevenson 2015) as:

> [*T*]he action of leading a group of people or an organization, typically towards a common goal. (n.p.)

Leadership is so much more than just this definition, and every law student has the potential to become a leader (Polden 2008:355, 401). The excursion is an opportunity where leadership skills can be taught to law students at the beginning of their university studies. The legal profession needs legal practitioners with strong leadership skills so that they can be agents of change. Polden (2008:357) confirms that including leadership sessions help students to develop their self-belief, the capability to see the changes that are needed in society and use the skills to convince others to effect the change. Effective leadership skills assist students to work better cooperatively.

Students should be taught to be leaders, not merely taught about leadership (Posner 2018:407). The conceptual considerations and practical fundamentals used to instruct and direct the leadership sessions are (Polden 2008:353–360; Posner 2018:399–409):

1. People are not merely born with leadership skills; it is a skill which can be coached and nurtured (Posner 2018:404). The students must have a desire to learn (Posner 2018:404), which the first-years attending the excursion possessed. The skills should be measured (Posner 2018:408) so that students realise it is a skill, which is why the students completed the core value index (CVI™) assessment.[6]
2. Leadership begins with yourself; it is a personal matter (Posner 2018:404). The first-year students need to know themselves before they can lead anyone.
3. Leadership is not restricted to a position; it is a process (Polden 2008:355; Posner 2018:405). The first part of the process begins with the leadership sessions during the excursion. The presenter should not rely on personal experiences, but the session should be evidence-based (Posner 2018:408).
4. Leadership builds relationships; true leaders serve the needs of others (Posner 2018:405). Leadership should be about influencing other people (Polden 2008:355).
5. The purpose of leadership, which is linked to number four, is to change the current situation by making it better (Posner 2018:406), whether through social justice or access to justice, for example.
6. Lastly, the students must have the opportunity to practice their leadership skills and thus put the values into action (Posner 2018:406, 408). The first-year students had various opportunities to practice and grow their

---

6. The CVI is discussed under the practical leadership sessions herein.

leadership skills during the excursion through student-centred problem-based learning and their time at the faculty and University.

The practical sessions presented by a life coach from the John Maxwell Team followed the conceptual and practical framework, as will be illustrated below, by focusing on who the students were and how they could influence others. The students had opportunities to practice their leadership skills in the group activities, such as the ice-breaker activity.

Prior to the excursion, the students had the opportunity to complete the CVI™ assessment. During the first session, the students received feedback on the CVI. The CVI is an assessment that characterises and quantifies the 'unchanging innate nature of a person' as defined by Abraham Maslow (Blignaut n.d.). The purpose and aim are for people to discover where and how they could make the most productive contribution to the world (Blignaut n.d.). It is thus important that the students understand their qualities and how to use them to effect change; as determined in the conceptual framework, leadership begins with oneself. During the sessions, the core values are explained, and the strengths and weaknesses of each, and how we all need each other to grow and make an impact. The session will enable the students to explore their CVIs and how they can use the knowledge to change their approach to working with and approaching other people.

The second leadership session focused on the Law of the Mirror, one of the 15 Invaluable Laws of Growth (Maxwell 2012). The session highlighted our perception of ourselves. If our self-perception is distorted, then our attempts to influence others will be misguided or even manipulative. Students had, *inter alia*, the opportunity to use one word on how they would like people to describe them. The session aimed and equipped the students to see their value, and by realising their value, they can also impact others. As soon as the students embrace themselves, understand who they are, what they stand for, they are better equipped to lead others and change current situations.

The virtual excursion is an opportunity for students to form a network of support that will help and encourage them during their studies and as future legal practitioners. By using the tools available in a virtual environment, such as break-away rooms, chat box, emojis, and enabled microphones, a sense of belonging will be created amongst the students.

■ Assisting students in developing a professional identity

■ The need for a professional identity

First-year law students may have various reasons for having selected law as a chosen career. It could be because of what they saw in a legal drama series;

perhaps a particular case reported on the news ignited their passion, or someone they know (not themselves, one hopes) had a brush with the law and that ignited their interest in studying law themselves. Whatever the reason, nothing is better for learning more about what this profession entails than engaging directly with experienced legal professionals. Judging by the quality of some of the courtroom scenarios depicted by some of the drama series shown on television, it can be confirmed that what one sees on television is not always what one gets in practice. The apprenticeship of observation, a term coined by Dan Lortie (1975), denotes a phenomenon in terms of which education students' perception of what a teacher is or ought to be is limited to what they have seen in the past in the classroom, and such assumptions could be what influenced them to pursue teaching as a career. At that stage, students may not be aware that their embedded assumptions or ideologies of what the profession entails represent only a partial view of the job (Smagorinsky & Barnes 2014:30). Of significance, Borg (2004:274) recognises that this is also similar to novices learning in the legal profession.

Indeed, there is more to being a lawyer than just wearing a black gown and throwing a few legal terms around in court. The field of law is so broad that without relevant information, it may be difficult to decide on whether one is a prosecutor, private attorney, legal advisor, or human rights activist, or whether one is to serve in the office of the Public Protector, the Master of the High Court, the office of the Chief Justice, academia, or any one of the other possibilities. The aim is to have each student that attended the excursion leave with a clearer view of what their chosen profession entails and what it will take for them to make it in the legal field.

Being a law student is no easy journey. It has been found that many law students tend to struggle with substance abuse and mental health issues, and this requires law schools to be more proactive in cultivating their students' professional identity in the earlier years of studies and to thus prepare them for the challenges of practice (Madison & Gantt 2019:162). This was the idea behind including a session specifically on behavioural ethics in the excursion. The session focused on the regulation of legal practitioners in South Africa, as well as the link between ethics and the law. Students were encouraged to introspect and contribute their appreciation of ethics through the use of break-away rooms. An ethical or principled lawyer is made in university, not necessarily in practice. If legal ethics are not inculcated into students in the earlier years of study and are rather left for the final year or perhaps not addressed throughout the curriculum, it may lead to students perceiving that they are not important. Research has been conducted on the lack of ethics as an area of concern or as one of the factors that affected the quality of the *Baccalareus Legum* (LLB) (Koraan 2017:106; Quinot & Van Tonder 2014:1381). It is therefore imperative that students be acclimated to the importance of professional ethics as early as the first year.

The value of an excursion in the first year of studies cannot be overemphasised, particularly because the first year is typically dominated by the classroom rather than experiential learning (Cohen 2006:147). Hence this excursion is not only for the benefit of the present or for purposes of entertainment, but it is rather intended to set the students up for lifelong learning. Marjan and Peyman (2012:399) describe lifelong learning as the continuous building of skills and knowledge throughout the life of an individual. The excursion, furthermore, lays a firm foundation by serving as an opportunity for law students to begin the process of transforming into lawyers. From this experience, tomorrow's legal eagles and trail-blazing advocates are born.

■ Inculcating professional communication and behaviour in students

On the first day of the excursion, students attended a session on professional communication and behaviour, including the use and effect of social media on one's career. Good communication skills are a vital attribute of a successful legal practitioner. To advance students into well-rounded legal practitioners, developed skills had to include both oral and written communication. Students were further warned of how using personal social media irresponsibly could damage one's legal career even before it starts. Nonetheless, because of the current technological advances, Heinrich (2015:115) noted that social media can also be used as a great marketing tool for attorneys and their law firms. For this to be effective, however, students would have to develop skills for professional writing.

■ Presentations from practice

A practitioner from the Law Clinic shared his expertise on criminal litigation, with particular emphasis on social justice, particularly from the criminal law perspective. Through this session, students were sensitised to the idea that society encompasses a collective of people from different backgrounds and social standing and how this can affect access to justice and other basic needs. Students must therefore be developed into legal practitioners who are 'socially conscious'.

Furthermore, a practising attorney at a leading law firm shared with the students how to spend their years at university preparing for embarking on their chosen direction in practice. It was quite refreshing to hear a not-so-common perspective from a lawyer specialising in intellectual property law. Lessons shared through the presentation as well as the question-and-answer session that followed included questions such as the difference between an advocate and an attorney and whether a legal practitioner can be enrolled as both an attorney and an advocate at the same time. It is important to introduce

students to different lawyering roles and to have them comprehend how the entire legal system works (Cohen 2006:159).

Student experiences whilst engaging in social justice, inclusion, and diversity

Social justice is not a universal concept that can only be applied in one way, but the concept of social justice is much broader and more complex (McKenzie et al. 2008:114). Social justice and diversity were the overarching themes of the virtual excursion. Campbell (2014) submitted that:

> A good lawyer, particularly in the current constitutional dispensation, is so much more than one who knows well the law and how to apply it. Social justice values of equality, human rights and freedoms are pervasive in the constitution, which all lawyers have a duty to safeguard. (n.p.)

It is thus evident that an excursion for law students cannot be planned without focusing on these important values of social justice, inclusion, and diversity.

Social justice

One of the sessions called 'The Hunger Games' was designed to make students aware of the social circumstances in their communities. The concept of social justice is based on the thought that everyone has the right to fair treatment and that people should share the benefits that society has to offer (Loewen & Pollard 2018:1). The session started with students getting assigned a random gender, age, and nationality from either a developed, developing, or underdeveloped country. Each student then received a different amount of currency depending on their country and social status as indicated. They were then able to purchase different food items online, based on the amount of money they received, if any. After this activity, students joined different break-away rooms to discuss social injustice and the impact it has on each individual.

A discussion on the decisions that each person made will contribute to addressing the social injustices in our communities. Some students who received plenty of money might be willing to share their food or donate some of their money to those less fortunate. This is a form of social justice called distributive justice, where those in advantageous positions are willing to redistribute their resources to those who are in disadvantaged positions (Tyler 2000:3). Others might feel that they need to save their extra money for future use. People will often compare the situation they currently find themselves in to their standard of living in the past or a standard of living at which they could find themselves in the future (Tyler & Smith 1995:4). This could also explain why some people might prefer not to share their food or money. Tyler writes that true social justice may only be achieved when people are willing to help others (Tyler 2000:3).

When engaging in social justice discussions, it is easy to see that we need to be more aware of our social surroundings. We as individuals need to reach out to the community around us and, wherever possible, help those in need. Tyler and Smith write that social justice and research on social justice largely focus on issues of allocation (Tyler & Smith 1995:2).

A social justice perspective from the Law Clinic also needs to be shared. This presentation can lead to students realising how social injustices affect the community directly around them. Real-life stories can be shared to explain how individuals in our everyday lives are impacted by the social injustice created in our society. The role of the law clinics can be discussed and how they assist communities in addressing these injustices.

■ Inclusion and diversity

The gender theory workshop has the potential to open students' minds to be more inclusive in their everyday lives. In this workshop, students were made aware of the intricacies of gender. The session focused on the different gender identities and how these different identities function in our communities. Students learned how certain traits that are associated with different gender identities can be misleading and how social media can cause us to stereotype people with different gender identities. Loewen and Pollard write that new ways should always be explored to include every person in order to create an environment that minimises the need for constant different treatment (Loewen & Pollard 2018:8–9).

All these sessions can help students gain a better understanding of social justice, how to be inclusive, and how to embrace diversity in our society. These topics contributed to ensuring that the aims and goals of the Faculty of Law online excursion were met.

■ Conclusion

Whilst it seemed daunting to adapt from a face-to-face excursion to an online excursion, the online excursion could be successfully implemented, and the aims and goals were met.

Technology underpinned the online excursion, and it was quickly realised during the planning that some of the technical features that seem advantageous do not always help or contribute to the aims and goals. Presentations in general happened smoothly, but some of the sessions that were prerecorded led to students losing interest and seemed less interactive. Keegan (1986:89) shows that students need to interact with instructors and other students. If the presenters are not available for the question-and-answer session, it can be a big challenge for students, because they are not able to engage with the

presenter. Whilst students will still be able to leave their comments in the chat box and get some interaction from the facilitators, the recommendation would be to make use of more live (synchronous) presentations and, if prerecorded sessions are used, to ensure that the presenter will be present for feedback.

It is also vital that students have data and a stable Internet connection so that they are able to connect and interact and enjoy the sessions. The faculty ensured that students received data, but external factors like the stability of the devices, weather conditions, load-shedding, etc. all have an impact on the students' connectivity.

In 2021, as part of a pilot project implemented by the Faculty of Law, participation in the online excursion was voluntary. The Law Faculty is investigating the merits of making the excursion compulsory (as the Faculty of Education does) and also to form part of one of the core modules in their first year. This will assist all the first-year students from the Faculty of Law in receiving the same exposure and opportunity to grow and to practise their skills in the module content as well, where progress can be measured.

Design thinking in developing a virtual work-integrated learning experience for health sciences students

Gerda Reitsma
Centre for Health Professions Education,
Faculty of Health Sciences, North-West University,
Potchefstroom, South Africa

Rhea Koch
Centre for Teaching and Learning, North-West University,
Potchefstroom, South Africa

Yolande Heymans
Centre for Health Professions Education,
Faculty of Health Sciences, North-West University,
Potchefstroom, South Africa

Gontse Mokwatsi
Hypertension in Africa Research Team,
Faculty of Health Sciences, North-West University,
Potchefstroom, South Africa

Sanette Brits
Hypertension in Africa Research Team, School of Physiology,
Nutrition and Consumer Sciences,
Faculty of Health Sciences, North-West University,
Potchefstroom, South Africa

Susanna M. Hanekom
Centre for Health Professions Education,
Faculty of Health Sciences, North-West University,
Potchefstroom, South Africa

Elizabeth I. Smit
Research Entity: COMPRES,
Faculty of Health Sciences, North-West University,
Potchefstroom, South Africa

■ Abstract

The transformation from face-to-face interactions to online environments, because of the COVID-19 pandemic, disrupted the higher education environment in many ways, of which the social integration and the development of professional identities of first-year students are concerning examples. The Faculty of Health Sciences is a complex faculty, providing programmes in several health professions (Sport Sciences, Biokinetics, Recreational Studies, Physiology, Consumer Sciences, Dietetics, Occupational Health and Safety, Nursing, Psychology, Social Work, and Pharmacy). Most of these qualifications include some form of WIL as part of the professional development of the future health professional. The challenge was to design a virtual WIL experience that will accommodate these professions in terms of focus and outcomes that are relevant and applicable to all these health professions, on a level appropriate for first-year students. An interprofessional team of health sciences academics, an online design expert, and a graphics designer worked collaboratively to plan and create a virtual first-year WIL excursion, based on the principles of design thinking. Design thinking entails five phases: empathy, define, ideate, prototype, and testing. As a first phase, the design team focused on describing the audience (first-year students) in as much detail as possible, as it informed many of the future design decisions. During the define phase, the specific context and characteristics of the audience were clarified, with a focus on articulating project outcomes in line with the needs of the audience. During the ideate phase, the team brainstormed several issues related to the design of a virtual excursion, including the theme, content, online platform, and learning activities. These ideas were then applied in the creation of a prototype which was then tested and refined until it was ready to be implemented. The team focused on clear communication, not only during the design process, but also in the designed virtual project, where different stories, ideas, concepts, reflections, and learnings were integrated to accommodate the diverse health science student group. Ultimately, the design thinking approach resulted in a project where the people (interprofessional design team and students), tools, and techniques (software, graphic design skills) were combined successfully in the design of a virtual WIL excursion project, the Health Hero project, for the health sciences first-year students.

■ Introduction

The Faculty of Health Sciences of NWU participated in a multifaculty WIL project, with the aim to provide health science first-year students an opportunity to experience the world of a health professional through a virtual excursion. Previously, these excursions (presented by the Faculty of Education) took place in off-campus settings, with students participating in face-to-face CL activities. Because of the COVID-19 pandemic and the subsequent move to virtual learning, the health sciences WIL project had to be designed as such to enable successful execution in an online environment, whilst still adhering to the proposed outcomes of the WIL project (funded by a UCDG grant by the DHET).

The real-world professional experiences that students acquire through WIL contribute towards their professional development and a better understanding of their own professionalism and identity (Bowen 2018). In order to produce competent future health professional employees with professional identity, WIL (as part of their professional development) provides students with various skills before they enter their workplace (Coll & Zegwaard 2006). Some of the guidelines that WIL focuses on to ensure professional competence of students include cognitive, behavioural, and technical skills as well as individual attributes such as knowledge, skills, and attitudes (Coll & Zegwaard 2006). To adhere to these guidelines, the main aim of our project's online activities is for our health sciences students to acquire knowledge and understanding of admirable characteristics, values, and behaviours of a health professional. To make this learning experience easy to understand for our students, the initial focus of the activities was to use a platform such as a virtual excursion and for students to use their own life experiences in the health environment and their chosen health profession. The use of virtual excursions was reported to be associated with students' active learning and constructing their knowledge rather than just passively learning new information 'in a COVID-19 world' (Ferdig & Pytash 2021). This approach links clearly to the theoretical lens of constructivism, which indicates that learning involves an active process of knowledge construction. Fosnot (cited in Hamat & Embi 2010:238) refers to four views of constructivism, which were all applicable to the learning taking place during this virtual excursion. The first view is that knowledge depends on past constructions existing as mental frameworks. The design team worked from the viewpoint that the first-year students must have had some experiences with health professionals in different health care settings, whether in a clinic, a general practitioner's consultation room, or a hospital. These prior experiences will have contributed to them constructing a personal mental framework of what they understand a health practitioner does and how such a person should behave. Through the virtual excursion, students gain new knowledge by reconstructing and reconstructing frameworks as they are exposed to new scenarios. The second view is that knowledge is created

through assimilation and accommodation. Students assimilate familiar information (typical characteristics of a health professional) into their mental framework, whilst at the same time accommodating new or unfamiliar information (new concepts of ethical and professional behaviour) into their mental framework. The third view approaches learning as an organic process of invention where knowledge is continuously constructed and enriched by investigation, predicting, imagining, and invention. These are all activities built into the virtual excursion as students had to invent their own Health Heroes based on the investigation of professional behaviours depicted in virtual scenarios, imagining what kinds of behaviours are appropriate in their own professions. The last view of constructivism encompasses reflective learning that encourages meaningful learning as cognitive conflict is resolved. Students were constantly reflecting on their own characteristics as health professionals in the making, how the information that they received through the virtual excursion aligned with their current understanding, or how it challenged them to think differently about their own values and behaviours.

■ Context

A transdisciplinary team of health sciences academics, a learning experience designer and a graphic designer specialising in online illustrations worked collaboratively to plan and create the virtual first-year WIL excursion for the Faculty of Health Sciences through design thinking. The Faculty of Health Sciences is a large and complex faculty providing programmes in a number of health professions (Sport Sciences, Biokinetics, Recreational Studies, Physiology, Consumer Sciences, Dietetics, Occupational Health and Safety, Nursing, Psychology, Social Work, and Pharmacy). Most of these qualifications include some form of WIL as part of the professional development of the future health professionals. The challenge was to design a virtual WIL experience that will accommodate all these professions in terms of focus and outcomes that are relevant and applicable to all of these health professions, and on a level appropriate for first-year students. Although the Faculty of Education provided a 'blueprint' of previous WIL excursions (answers to the *what* and *why* questions), the health sciences design team had to rethink the project as it had to be adapted for both the complex health science context and the virtual environment, treading into unfamiliar territory (finding answers to the *how* question).

Most of our first-year students in the Faculty of Health Sciences in 2021 have not experienced face-to-face engagement with their lecturers during the year. A few of the students may have changed programmes and are historical second-year students but academically first-year in the Faculty of Health Sciences. These students may have experienced about 8 weeks (from the first week of February until the last week of March 2020) of face-to-face contact lectures before the first national lockdown was implemented; however, none

of the students who participated in this programme had any official face-to-face, on-campus contact with their health sciences lecturers or with their peers, which may have resulted in a feeling of isolation and disconnectedness (Phirangee & Malec 2017). Students had to engage in online learning, which placed additional strain on them. For this reason, the focus of the virtual excursion was not so much an academic experience but to help them with self-awareness as future health professionals, to encourage them to become involved with others, and to experience the health science academic platform. The aim was to support their integration into the higher education context (Schaeper 2020) and to help them relate to their peers in the Faculty of Health Sciences.

With the purpose of the WIL excursion in mind and the example provided by the Faculty of Education as guidance, the Faculty of Health Sciences embarked on designing a WIL excursion for first-year health sciences students, following a design thinking process.

■ Design thinking

Cross (as cited by Slater, Dhanasekaran & Govindarajulu 2020) describes design thinking as:

> [*A*] multi-dimensional, human-centered method for innovation that develops through the joining of human desirability, business viability, and technical feasibility. (p. 114)

Design thinking originated from product designers who captured, in a structured way, the creative and innovative processes used when developing new products (Sandars & Goh 2020). Design thinking has increasingly been implemented in other areas such as medical education (Sandars & Goh 2020), pharmacy education (Slater et al. 2020), and higher education in general (Beligatamulla et al. 2019). According to Pusca and Northwoord (2018), an educational problem can be approached from a problem-oriented thinking, which is closely linked to critical thinking, asking the *what* and *why* questions, or from a solution-focused thinking, linked to creativity, by asking the *how* question. The solution-focused thinking is a typical approach relevant to design thinking, resulting in creative solutions to problems or better yet, a solution-focused thinking strategy. Pusca and Northwoord (2018) aptly call it experimental thinking. In this project, the team responsible for the design of the virtual WIL excursion in health sciences had to come up with an answer to the question: *how can a virtual excursion be designed that will provide a WIL experience similar or comparable to the purpose and approach of the Education and Law excursions, whilst taking into consideration the unique context and complexity of the Health Sciences?*

For this question, design thinking or experimental thinking was appropriate. Luka (2014:63) describes design thinking as 'an approach that focuses on

creation and the way of changing or adapting existing conditions to ones that would comply with the current context', which aligns well with this project.

Wolcott and McLaughlin (2020) mention three basic phases in the design thinking process, namely inspiration, ideation, and implementation, as was originally described by Tim Brown in a business innovation context (Brown, cited by Wolcott & MacLaughli 2020:1271). Later versions added two more phases as part of the inspiration phase, namely empathy and define. Implementation was also extended to include prototyping and testing (Kelly, cited by Wolcott & McLaughlin 2020:1272).

In this chapter, we applied the extended version of design thinking by including empathy and define as well as prototyping and testing in the design process, as depicted in Figure 13.1. It is important to note that, as with most design processes, design thinking is neither linear nor one-directional (indicated by the arched arrows in Figure 13.1).
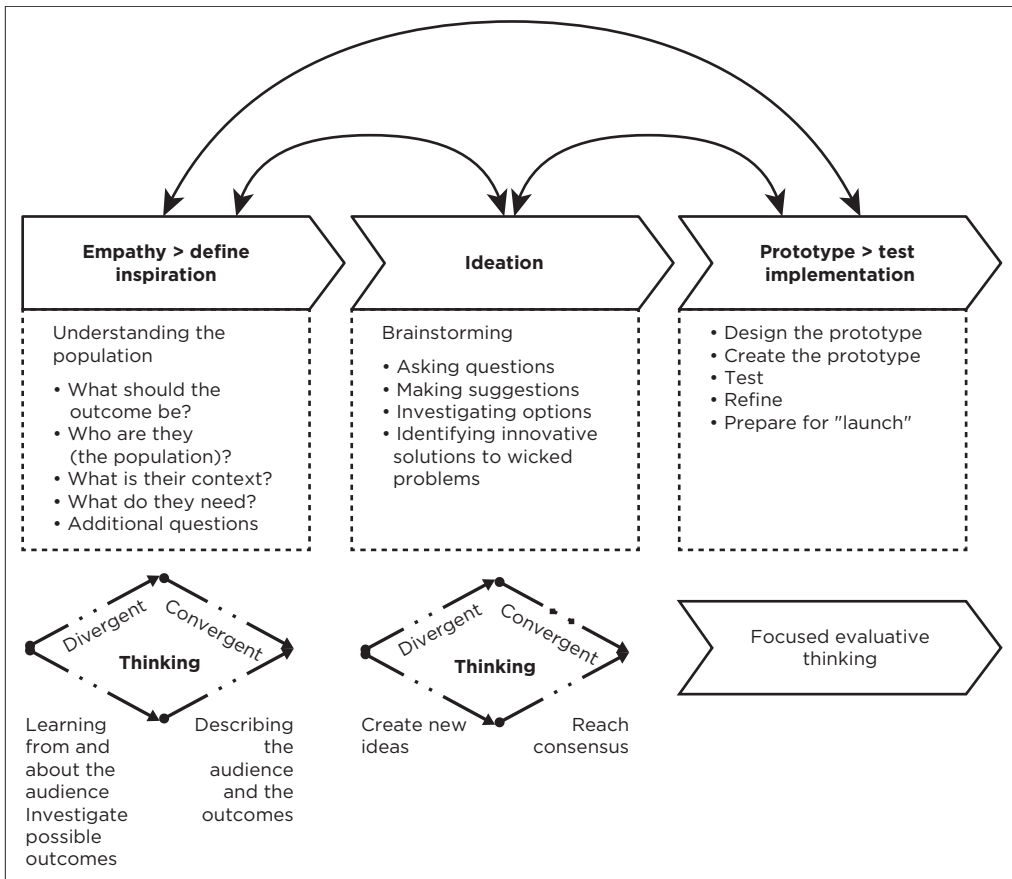
Source: From Botha-Ravyse et al. (2018:5); Pusca and Northwood (2018:49); Wolcott and McLaughlin (2020:1272).
FIGURE 13.1: The design thinking process as applied in the virtual excursion design.

The success of design thinking lies in the ability and affordance of allowing for an iterative and cyclic process to occur that can be repeated until the most appropriate solution or product emerges (Elwood et al. 2016). In the rest of this chapter, we will explain how the different phases of design thinking (as depicted in Figure 13.1) were applied during the development of a virtual WIL excursion for first-year health sciences students. We will substantiate the success of the design process with data derived from a post-excursion survey completed by the students who participated in the Health Hero virtual excursion.

The virtual excursion was seen as a pilot project, and student participation was entirely voluntary. When the call for participation went out, 357 students (Potchefstroom Campus = 241, Mahikeng Campus = 64 and Vanderbijlpark Campus = 52) indicated that they would like to be part of the project. With a follow-up email, students were asked to confirm their commitment to participation in the project, with 242 students confirming (Potchefstroom Campus = 155, Mahikeng Campus = 33 and Vanderbijlpark Campus = 36). These students all received data to enable them to participate in the online environment. Unfortunately, a large percentage of these students did not continue with the project once they had received the data, resulting in 74 students (Potchefstroom Campus = 51, Mahikeng Campus = 6 and Vanderbijlpark Campus = 11) completing and submitting the final assignments. A post-excursion survey containing quantitative and open-ended questions was distributed via email to these 74 students, and feedback was received from 28 students. Although this chapter is predominantly conceptual in nature, the feedback of the students is integrated into the explanation of the Health Hero design and execution.

■ Application of the design thinking process
■ Stage 1: Inspiration – Empathy

The Empathy phase required the design team to learn about the audience for whom they are designing (Crichton 2018).

Wolcott and McLaughlin (2020) describe empathy as the phase where the designers get to know the user and their needs and understand their perspectives. Slater et al. (2020) explained that they demonstrated empathy with students throughout the testing of ideas in a curriculum revision project. Traditionally, before COVID-19, first-year students were assimilated into the university environment through specifically designed reception and orientation programmes. Students had the opportunity to meet other students, learn about the university environment and develop an identity as a university student. The first-year students who participated in the WIL excursion were of the cohort that started their university life during lockdown, with no face-to-face experience of university life, no face-to-face socialising with peers, and

no opportunity to form an identity as a university student, much less as a health sciences student. Mentoring and guidance about the university environment were limited. De Beer, Petersen, and Dubar-Krige (2011) also mentioned that many first-year students may typically see themselves as being unimportant in the greater university community, and this situation may have been exacerbated by the lack of opportunity to be physically present at the university. The design team of the virtual WIL excursion had to take into consideration that these students did not have a professional identity yet. In addition, these students may not yet be so fluent in the use of the LMS (Sakai platform – eFundi) and online collaborative work, as they had only one semester's exposure to the online learning environment. The students were representative of all three campuses of the NWU, diverse in culture and language, with first-generation students working alongside students who came from families with generations of university graduates and experiences.

◼ Stage 2: Inspiration – Define

During the define phase of design thinking, questions that guided the project had to be redefined and refocused based on the insights gained from the empathy stage. It was important for the design team to understand the population for which the virtual excursion is to be developed. Levinson's theories of life structure (1986) are upheld and applicable as they allude to the shaping of one's interactions with the environment, which includes people, institutions, things, and places, causing a person to decide about their dreams, values, and emotions. Levinson (1986) explains that during the stages of life from pre-adulthood to late adulthood, the life cycle consists of alternating events of structure-building and transitional periods. The transitional periods terminate the existing life (in this case pre-adulthood) and create the possibility for a new one (early adult transition). Levinson (1986) captured the ages of 17 to 22 as the developmental timespan that links pre-adulthood with early adulthood, mentioning that it is often a stressful phase. Given that the first-year students are in a transitional phase into early adulthood and life changes, they also have to contend with the COVID-19 pandemic as well as a new way of teaching and learning. The first-year students' understanding of what university life is and their perceptions of what their future health professions entail are based on what they have experienced or observed so far in life (Fosnot's first view of constructivism), and they may not be an accurate depiction of the reality. This phenomenon was defined by Lortie (1975) as the 'apprenticeship of observation', which is further discussed in Chapter 11. Even in the revisiting of the 'apprenticeship of observation' phenomenon by Mewborn and Tyminski (2006), it could be seen that students have certain ideas and beliefs when they enter a program. In the feedback received from the participants about the project, it was confirmed that their initial

understandings of their own professions and other health professions were changed:

'I have learnt that being in health is not all about salary, and that you are not only dealing with physical things but also emotions.' (Student 12, Post-excursion feedback, 13 September 2021)

'This project has allowed me to reflect on my own values as well as learn new values from others.' (Student 14, Post-excursion feedback, 13 September 2021)

'I learnt from so many other students what their view is on who and what a Health Hero should be.' (Student 16, Post-excursion feedback, 13 September 2021)

'It was interesting to meet students from different study fields.' (Student 20, Post-excursion feedback, 13 September 2021)

'I really learnt a few things, and with this program I gained a lot more respect towards the health professionals. Work isn't always that easy and the people they are working with aren't always that easy to communicate with, but still the health professionals carry on because they have the exact characteristics to know what to do in situations and how to act and be professional and how to respect the other.' (Student 25, Post-excursion feedback, 14 September 2021)

The design team acknowledged that the students were entering their university career with a specific skillset, prior knowledge, and experiences regarding online learning and their health professions. The team had to implement plans to ensure that students were offered convenient services in the online environment and that they acquired basic skills to develop their professional identity through WIL. In a traditional face-to-face setup, the lecturers would have been able to interact with the first-year students in a physical classroom space, where traditional classroom management skills would have enabled the lecturers to react to students' nonverbal and verbal responses, behaviours, and needs. Kounin (cited by Notar & Sorbet 2020:59) calls this 'withitness' – the ability of a teacher to know what is going on in the classroom and to step in and change behaviour when needed. With the online environment, we had to find alternative ways to create withitness, and we relied on Notar and Sorbet's (2020) guidelines for withitness in e-learning (cf. ch. 11, where withitness is discussed).

Nortar and Sorbet (2020:64) refer to clairvoyance, the 'supposed acute intuitive or perceptiveness to see objects or events that cannot be perceived by the senses … to identify the needs of your students'. In this case, we relied heavily on the members of the team who had previous experience in teaching first-year students and experience in developing online learning activities. Their familiarity with the learning context enabled them to share ideas and suggestions based on their intuitive understanding of what will work and what will not. These lecturers provided practical advice on how to effectively communicate with and relate to first-year students. They were also able to anticipate certain practical problems with logistics, technology, and practical application, which we could address proactively in the design of our excursion.

We realised, for instance, that most students will require data in advance before a session so that they are able to join and that most students will complete the virtual excursions on a cell phone rather than a personal computer or laptop. The experienced first-year lecturers also pointed out the importance of clear communication channels and the value of clear instructions so that students can know exactly what is expected of them. Nortar and Sorbet (2020) suggest that instructions and explanations should be written as if you were face-to-face and having a conversation with the student.

Student feedback indicated that the design team succeeded in designing effective communication into the virtual excursion, as is evident from these comments:

> 'The project was well explained – I understood what was being expected from me.' (Student 13, Post-excursion feedback, 13 September 2021)

> 'I received adequate support, because firstly, the instructions were given very clearly, and secondly, if I had any questions or was unsure about anything, I could just send an email to one of the leaders in this program and I would get immediate answers and support on what to do next.' (Student 25. Post-excursion feedback, 14 September 2021)

In addition, students need to be able to ask questions if and when they require support, similar to what takes place in a face-to-face classroom. We have created an online question-and-answer discussion forum in the LMS, managed by one of the team members, as recommended by Nortar and Sorbet (2020), and the students created WhatsApp groups with their team members to enable fast and continuous communication. We also scheduled Zoom sessions with all the students and the design team where the participating students met the design team and their co-participants, and they were introduced to the project. This empathetic approach enabled a process of open communication, clarifying misunderstandings, increasing cooperative behaviour, and problem-solving, as is evident from the following feedback:

> 'The leaders of the project were very interactive and replied fast regarding emails.' (Student 3, Post-excursion feedback, 13 September 2021)

> 'Project coordinators were always willing to help and provided multiple platforms where students could log potential questions.' (Student 14, Post-excursion feedback, 13 September 2021)

> 'The frequent emails reminding us what to do and the timeline of the Zoom sessions were perfect. Communication was also very clear.' (Student 21, Post-excursion feedback, 13 September 2021)

> 'There was always a person to help us […] when we didn't get the contents correctly.' (Student 24, Post-excursion feedback, 14 September 2021)

By acknowledging and understanding the student cohort for which the WIL excursion was to be developed, the theme, choice of the virtual platform, type of activities, and level of support designed into the programme were defined.

■ Stage 3: Ideation

The ideate phase took the most time and was the most challenging phase of the design process, but it was also exciting as it pivoted around identifying innovative solutions to the wicked problem(s) the design team was facing (Kateb & Allahdadi 2018; Kaur 2021). Wicked problems refer to those problems that cannot be solved through a systematic formula for solving problems, as they are technical without final solutions (Elwood et al. 2016). During the ideate phase, assumptions were challenged as innovative ideas were generated and options were explored. The ideas and options were then narrowed down to create an appropriate project scope and focus. The transdisciplinary nature of the design team contributed to the success of this phase, as the diversity of expertise and experiences created a rich, informative, and creative environment, whilst simultaneously providing critical reasoning and reality checks.

The ideate phase entailed the investigation, evaluation, and adaptation of ideas. Methods for generating innovative ideas include brainstorming, mind mapping, storyboarding, co-creation, and challenging assumptions (Dam & Siang 2020), and in this project, the design team used extensive brainstorming as the primary idea-generation method. Brainstorming involves generating as many ideas as possible from one central idea by leveraging the collective thinking and diverse perspectives of the group (Kaur 2021). Wolcott and McLaughlin (2020) best describe brainstorming as two separated processes, where the team first must create time and space for divergent thinking, followed by convergent thinking, where consensus building takes place (see Figure 13.1).

Focusing on one problem at a time, delving into the strengths of each team member, team members draw from one another to generate as many ideas as possible (Wolcott & McLaughlin 2020). Thereafter, the ideas are discussed and narrowed down to identify the most appropriate, workable, and innovative solution (Dam & Siang 2020; Kateb & Allahdadi 2018). This process supports the notion of Elwood et al. (2016:51) that design thinking is not a 'free-for-all' but a fine balance between the creative and the analytical.

Over a period of 4 weeks, the design team met on a weekly basis in a nonjudgemental environment (online) to brainstorm ideas and come up with innovative solutions. During these sessions, the facilitator created an informal and comfortable atmosphere, and creativity and the sharing of ideas were continuously encouraged. During the brainstorming session, ideas were captured, discussed, and illuminated until the team had the best workable solution (Razzouk & Shute 2012).

To ensure a rich and productive brainstorming session, team members were requested to focus on the task at hand (Pande & Bharathi 2020), and the

discussions started with clear and set objectives. Nortar and Sorbet (2020) refer to four basic questions:

1. What do you want students to be able to do?
2. How much time will it take for them to do it?
3. At what proficiency will they be able to perform the task?
4. What product will demonstrate that the objective was met?

Discussing one point at a time contributed to focused discussions and generating multiple ideas for the problem under discussion. To enhance focus, the session facilitator continuously reminded team members of the goal and when a member or members veered off, requested members to stick to the topic (Marra et al. 2018). It was, however, also important not to disregard points raised during these 'alternative pathways' of discussions, as many points that were relevant at a later stage of the process were mentioned. As creativity and seeking innovative problem solutions are the main aim of the ideation stage, it is important to ask the right questions and explore alternatives over and above the obvious solutions (Kaur 2021; Pande & Bharathi 2020). Both Marra et al. (2018) and Eris (2003) confirmed the importance of asking the right questions during design thinking. Asking questions is a fundamental cognitive mechanism in design thinking; it ensures that members think outside the box and encourages members to build on each other's ideas, insights, and perceptions when generating solutions.

We relied upon Eris's five categories of generative design questions (Eris 2003) during the divergent and convergent stages of refining the virtual excursion.

☐ Proposal-negotiation questions

The questioner suggests a concept or an opinion on a concept and expects the answerer to supply his or her own corresponding opinion(s). Through this dialogue, a form of negotiation is taking place in which new possibilities and concepts are generated. Eris (2003) explains the significance of these type of questions for design thinking as they promote consideration of and feedback on proposed ideas, resulting in a continuous analysis and synthesis of information.

> **Example**: Because of the complexity of the range of health sciences curricula presented in the Faculty of Health Sciences and taking the characteristics of the first-year student cohort into account, the team had to identify a theme or topic on which the concepts of health sciences, student identity, and professional identity can hook. Team members made a number of suggestions, and through feedback and negotiation, the feasibility of the concepts was explored until the final idea of creating a Health Hero was agreed upon. (This is similar to the leitmotiv used by the Faculty of Education of a 'super-teacher', as it also draws on the genre of superheroes.)

The proposal-negotiation type of questioning was utilised at different stages of product (with reference to the virtual excursion) development, as pedagogically sound and practically feasible online activities had to be designed. For example, a team member suggested the use of 360-degree images in the virtual excursion, which opened the floor for discussions on the practicality of using these types of images, their availability and cost, and the integration thereof into the virtual scenarios to be developed.

☐ Scenario creation questions

With scenario questions, the questioner includes a scenario in the question and wants to find out what the possible outcomes can be. Eris (2003) regards this as a form of causal consequence questions; however, where causal consequence questions result in a yes-or-no answer, scenario questions encourage multiple possible answers and create hypothetical causal chains. A possible scenario is created that allows for the investigation of possible outcomes and the refinement of design requirements.

Example: Students use multiple devices to access online learning activities. The scenario creation question was: 'What will happen if a student opens the virtual tour on a smartphone instead of a computer?' The design team had to investigate possible outcomes of this scenario and find practical solutions for problems that may arise. A typical outcome was the decision to use Question Pro software for the activity questions and not Google Forms as was initially planned, based on the user experience of the Google Forms option on the smartphone.

☐ Ideation questions

The purpose of ideation questions is to generate as many concepts as possible without a specific goal in mind, but within the context of the project. These questions instigate multiple possible conceptualisations and causal links:

Example: When brainstorming the ways in which information can be shared creatively in an online environment, the ideation question 'are comic strips useful?' led to answers that generated many ways to utilise and incorporate comic strips into the virtual tour and assessments.

☐ Method generation questions

This type of question was asked to identify as many ways as possible to achieve the outcomes as set out in the project plan. Method generation questions are typical of the 'how' questions that generate multiple possibilities of methods of doing, within the borders of the project goals and outcomes (Eris 2003):

Example: Method generation questions were asked to identify what needs to be included in the design of the virtual WIL excursion to enable students to reach the following outcomes of the project:

For outcome 1: *Develop a fundamental awareness of one's own self in relation to the characteristics, values, and behaviours of a responsible and responsive health professional in South Africa* – the following method generation questions were asked:

'How do we make students familiar with characteristics, values, and behaviours of a responsible and responsive health professional in South Africa?'

'How can we get students to reflect on their own values and behaviours?'

'How can we include these processes into the virtual environment and activities?'

A second outcome: *Work as part of a team to gain a fundamental understanding of the characteristics, values, and behaviours of a responsible and responsive health professional in South Africa* – was addressed by asking:

'How do we incorporate teamwork in the project and activities?'

'How do we link teamwork to the characteristics, values, and behaviours we want the students to acquire?'

'How do we group the participants in a meaningful way?'

The last outcome: *Take responsibility and appropriate ethical action for his or her own development over the next few years as an emerging health professional within a structured learning event* – was managed with questions such as:

'How do we get students to reflect on their own development as emerging health practitioners?'

'What activities can we include that will enable participants to reflect effectively?'

☐ Enablement questions

An enablement question creates resources to question concepts. In a student learning context, this type of question is labelled as a 'deep reasoning' question that takes students into the higher levels of the cognitive domain (Graesser in Eris 2003:2). In design thinking, the deep reasoning questions (where factual reasons for a phenomenon are revealed) are adapted to general design questions to create multiple alternative known answers as well as multiple unknown possible answers. Enablement questions are typical in divergent thinking, where answers are diverted away from facts to possibilities (Eris 2003):

Example: The learning experience designer, in collaboration with the subject specialists had to decide which tools could be incorporated effectively in the online environment and which were appropriate for the outcomes of the project. Typical enabling questions asked were:

'Which online tools can be used to measure students' understanding of values?'

'Which online tools can be incorporated into the virtual tour to measure students' understanding of correct and wrong behaviour?'

These questions were important for the design team because it led to identifying multiple resources to reflect, challenge, and streamline the activity design of the project.

Once the team had identified multiple solutions to the problem, the final step in the ideate phase was to narrow the solutions down to identify the best and most practical solution, through the process of filtering and elimination. In theory, after summarising possible solutions, members should vote for their favourite idea (Pande & Bharathi 2020; Wolcott & McLaughlin 2020). Asking members to vote ensured that all members had an equal say in choosing the best suitable solution for the problem. However, because of the interprofessional nature of the team, the opinions and answers from the experts were determining factors; for example, suggestions on the use of comic strips or on the reflective activities that are possible in the virtual environment made by the learning experience designer were taken into account, rather than voting on it. Also, the opinions and inputs from the educational experts on the team contributed more to questions that focused on pedagogical methods. As indicated in the design thinking process, the departure points for developing engaging activities were real-world case studies (Crichton 2018). The health sciences subject experts contributed to the design of scenarios relevant to real-world case studies.

◼ Stage 4: Implementation – Prototype

The implementation phase is characterised by two processes: prototyping followed by testing (Wolcott & McLaughlin 2020). During the prototype stage, the ideas are made tangible by designing or building a representation of these ideas (Hasso Plattner Institute of Design at Stanford University 2021). The illustrator and learning experience designer played a crucial role in designing the virtual environment as described in the ideation phase. The health sciences academics (subject experts and educational experts) proposed activities that the learning experience designer and illustrator reconfigured into virtual activities. The learning activities in the virtual excursion took place within a video representation of the different health sciences buildings on the campuses of NWU. Different health scenarios were designed, with text conversations taking place between health professionals and patients. The illustrator had to take into account that the different health disciplines, genders, and cultures had to be included in some or other form in the scenarios. The discussions between the health professionals and patients had to illustrate both ethical and unethical behaviour. The learning experience designer created activity sheets with links to embedded videos and infographics on the online platform. The students were able to move from one virtual scenario to another as they selected various behaviour options and answered behaviour-related questions.

The design of the virtual environment required detailed planning, starting with the infographics, identifying and describing the different contextual environments (for example, a clinic or a staff room), and scaffolding the activities to create flow. During this process, the educational experts worked
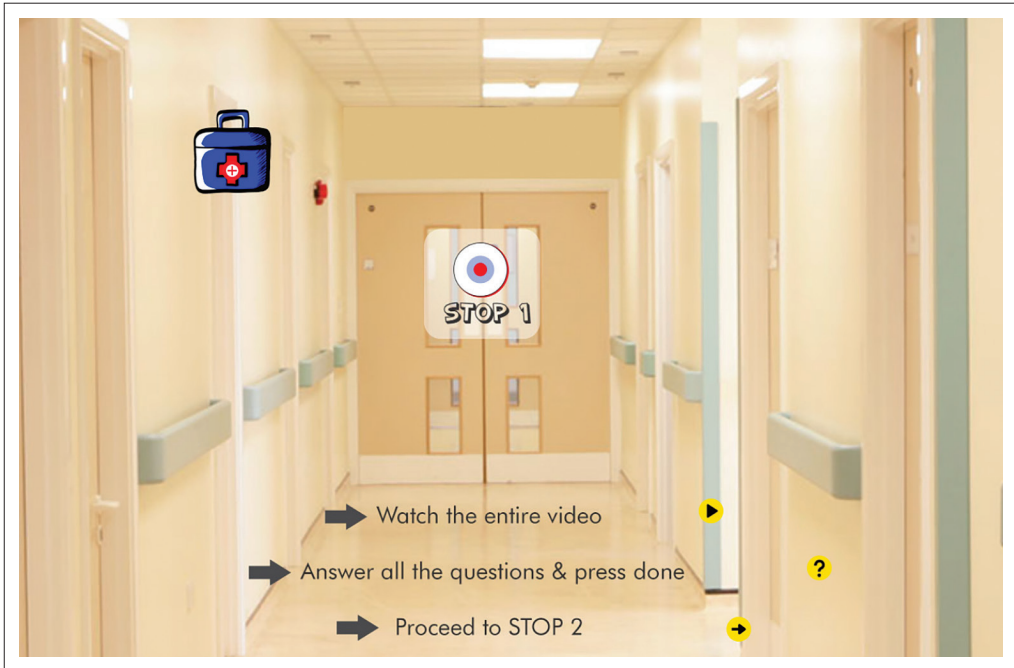
Source: Image design by Rhea Koch, published with permission by Rhea Koch.
FIGURE 13.2: Example of the hospital environment designed into activity 1.

closely with the illustrator and learning experience designer to ensure adequate built-in guidance to enable students to work through the virtual experience independently, whilst the subject experts confirmed the authenticity of the virtual designs. Figure 13.2 is an example of how the contextual environment of a hospital was designed into the first activity.

■ Stage 5: Implementation – Testing

After prototyping, the final solution or refined product is then tested. The testing phase is an extremely important and integral part of the design process, as information gained from testing clarifies to what extent the initial problem was sufficiently addressed and if the solution needs further refinement (Wolcott & McLaughlin 2020). During the initial weekly meetings, the prototypes of the different virtual activities were demonstrated. The feasibility of generated ideas was tested by having the team members test the activities by following a link, without prior instructions. Using this method, problems with navigation in the virtual environment were immediately identified and addressed. What we have learned from this experience is that the testing can be done on a smaller scale earlier in the project, rather than only once the activity design is near completion. By implementing continuous small-scale testing throughout the prototyping, possible problems regarding the appropriateness and implementability of the

virtual activities were detected earlier and saved valuable time. Testing in the early phase of the project also enabled the team to keep the activities connected to the outcomes, as the members doing the graphic media were not necessarily the content specialists. This then ensured that all were on the same page regarding the project design in general.

The testing phase emphasises the cyclical nature of design thinking as the design team was sometimes forced to revert to the empathy and define stages. In the final testing phase, a link to the activities was made available to members a few days before a meeting to enable them to test it on different devices such as laptops, desktop computers, and cellular phones. This was extremely important to make sure all the activities were compatible with all of these devices. Initially, multiple 360-degree images were used in the activity design, but in the testing phase, it was made evident that on some devices and with slower connectivity, it had an impact on the flow and user-friendliness. Some of these images were subsequently replaced by illustrations of other graphical elements.

In the post-excursion feedback, all the students indicated that the virtual activities were user-friendly, and explained:

> 'It was easy to access, and the worksheet was very fun and interactive!' (Student 8, Post-excursion feedback, 13 September 2021)

> 'The fillable PDF was easy to navigate and fill in, and I love the fact that we had "face-to-face" discussion times on Zoom!' (Student 16, Post-excursion feedback, 13 September 2021)

> 'Yes, the activity worksheet was a perfect guideline and the website used to create the storyboard was very user-friendly.' (Student 21, Post-excursion feedback, 13 September 2021)

The end product of the design thinking process was a virtual WIL excursion that required first-year health sciences students to design their own Health Hero in the online environment. The Health Hero theme was in line with the 'super-teacher' theme used by the Faculty of Education, requiring students to reflect on professional and ethical behaviour and attitudes that a professional health care practitioner should demonstrate. In the section 'The product: Designing your own Health Hero' of this chapter, the final product of the design thinking process, the virtual excursion, is described in more detail.

■ The product: Designing your own Health Hero

The virtual excursion focused on enabling first-year students to identify characteristics that should be evident in a professional health care practitioner and encourage them to reflect on their own values and behaviours as health profession students. Notar and Sorbet (2020) explain that considering students' backgrounds as you design material, asking what they are bringing to the class, contributes to withitness. The Health Hero theme was generic enough that students from different backgrounds and experiences could

identify with it and contribute to the process, as they would be able to recall prior experiences with health professionals in their own individual settings.

The virtual excursion was hosted on the LMS (eFundi) used by the students for all their online work at the university. A separate project page was created, to which all the students who registered for the project were linked. The learning design expert modified a generally used lesson design to introduce appropriate resources, provide specific task details, and build in activities to support the students in completing the virtual activities. Over time, the learning design expert developed the project site to be fit for purpose and to function as the main communication platform between staff and students. Bennet, Agostinho, and Lockyer (2016) classify this as contextual learning design, where information (such as content resources, dates, and messages) are included, in comparison with generic learning design, where no context-specific information is included. The functionalities available in the generic lessons design were perused and those that supported student support and interaction were included in the contextualised lesson, for example announcements, forum, assignments, and resources.

The students participated by completing an online activity sheet that was designed as a one-stop window where students could move through the scenarios and complete the activities with the click of a button (Figure 13.3). The design team was very aware of the difficulties that the first-year students might experience with online learning platforms, such as trouble finding the content and activities or figuring out how to access the worksheets, videos, or discussion forums. They implemented suggestions made by Notar and Sorbet (2020) to use meaningful images to create the necessary emotional impact and to support the content, making sure it was appealing and accessible to all students. The activity sheet was presented in a visual manner as an infographic indicating the different stages of the project, the outcomes, the timeline, and if the activity was individual work or group work.

The numbered activities were designed to have a specific start and endpoint. Each activity had a narrative as foundation. Cases portraying different ethical and moral situations were depicted in comic strips and integrated into a virtual tour using software called Thinglink. Figure 13.4 is an example of one scene from a comic strip depicting the reaction of a health care worker to her colleagues discussing a patient during a break.

The purpose of the activities was to involve the students not only theoretically but also emotionally in the case they were analysing and commenting on. Each component of an activity was presented and discussed by the design team. Based on the recommendations from the team, activities were revised, and various prototypes were utilised, including the worksheet (which includes all summarised activities with links involved in the project), a virtual tour, and Storyboard That.
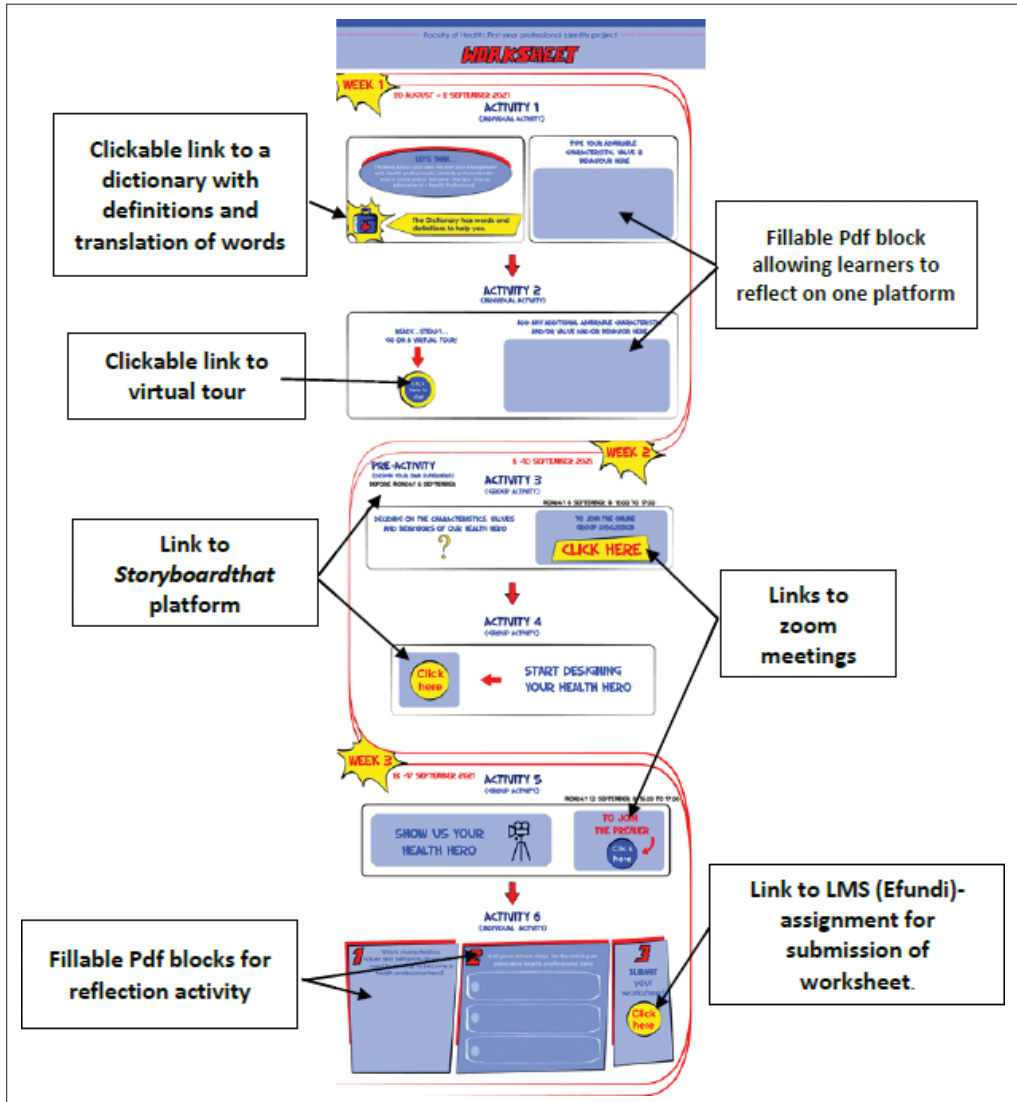
Source: Image design by M. Hanekom, published with permission from M. Hanekom.
Key: LMS, learning management system.
FIGURE 13.3: Design and layout of the virtual excursion activity sheet.

The sequence of activities started with individual activities and self-reflection, followed by structured group activities. The activities were designed in such a way that they informed the follow-up activities, which in turn elaborated on concepts captured in the previous activities. To ensure that students took note of how all activities in the project were interrelated and not just separate experiences, instructions for each activity were linked to the previous activity
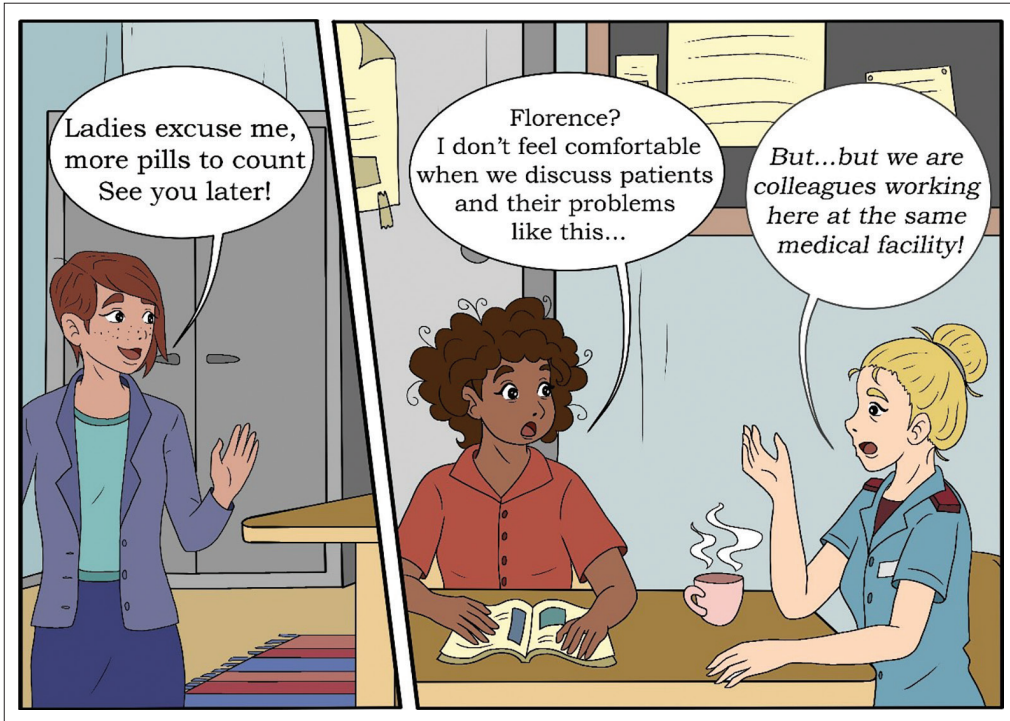
Source: Image illustrated and designed by M. Hanekom, published with permission by M. Hanekom.

FIGURE 13.4: Example of a comic strip scene created on Thinglink, depicting ethical and unethical behaviour of healthcare professionals.

and the next activity of the project (see Figure 13.2). Notar and Sorbet (2020) refer to this process as movement management, the momentum and smoothness of student engagement in the learning activities.

The first activity invited students to reflect on their own experience with health professionals and identify the characteristics, values, and behaviours that they viewed as admirable in a health professional. A dictionary list (in English, Afrikaans and Setswana) was linked to the activity sheet for quick reference to definitions and translations. This list assisted students in their reflection by introducing them or making them more familiar with the terms 'characteristics, values, and behaviours'. Notar and Sorbet (2020) recommend a specific focus on new vocabulary words linked to practical applications and examples in online classrooms.

Once they were familiar with the concepts, they moved to the second activity where they had to engage in an interactive virtual tour. The interactive virtual activities depicted four different scenarios, each with a narrative as foundation, of health and medical professionals interacting with each other and with patients. These cases portrayed different ethical and moral situations

depicted by either a short video or graphical media. Kounin (as cited by Notar & Sorbet 2020:61) warns against satiation, a situation where there is a progressive loss of interest in the task at hand. He suggests that activities should be designed and presented in such a way that students experience a feeling of progress by offering challenges throughout the lesson. During the virtual tour, the students were guided from one scenario to the next, where each scenario depicted a different challenge. The students thoroughly enjoyed the creative process and found the software fun and easy to use:

> 'The activities were not difficult to do. I honestly couldn't wait to create my Health Hero on Storyboard. That was the time where I could express my feelings towards becoming a Health Hero one day.' (Student 13, Post-excursion feedback, 13 September 2021)

> 'Yes, the virtual activities were very user-friendly, especially using Storyboard, it was very fun designing characters.' (Student 14, Post-excursion feedback, 13 September 2021)

> 'I enjoyed the activities, especially because everything was fun and colourful, I had the best time creating my Health Heroes, I felt like a cartoonist, the software they provided was easy to use as well.' (Student 27, Post-excursion feedback, 17 September 2021)

Following this activity, students were again invited to do reflection on what characteristics and behaviours they perceived as most important. This individual task was followed by interprofessional teamwork, where the team had to design and present their own Health Hero, based on input from all the members. To aid students in the designing of their Health Heroes, an easy online drag-and-drop creation platform called 'Storyboard That' was provided, which allowed students of all skill levels to create visuals. A video explaining how to use the software was posted on the LMS. In addition, students were invited to an introduction Zoom session, explaining how the program works and giving the students opportunity to ask questions. Figure 13.5 is an example of the group work activity designed to engage students in a reflective assignment based on what they have learned from the previous individual activities.

To showcase their co-created Health Hero, all of the groups joined the Showcase event on the Zoom platform. During this event, each group had the opportunity to show their Health Heroes to other groups (Figure 13.6). They had to give a short description of the hero they had created and explain the name they had given him or her. They then expanded by mentioning the responsive and responsible characteristics, values, and behaviours that made their Health Heroes great.

The last activity invited students again to really do introspection and look at the characteristics, values, and behaviours that they personally still needed to develop to become good health care professionals. They were

Source: Image design by Rhea Koch, published with permission by Rhea Koch.
FIGURE 13.5: An example of the group-work assignment.
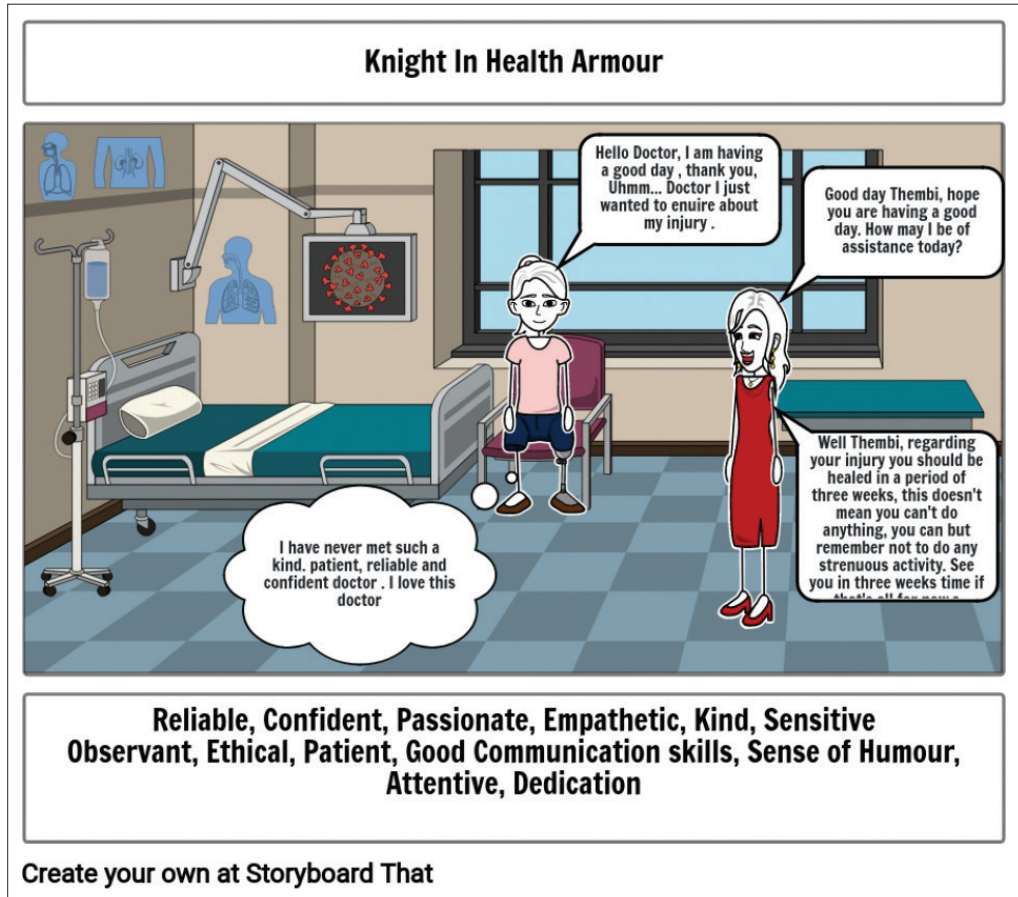
FIGURE 13.6: Example of a Health Hero created on Storyboard That for the group activity.

called to list three action steps for becoming admirable health professionals. Figure 13.7 is a screenshot of a student's action steps listed on the activity sheet.

The virtual excursion put the students into critical thinking mode which is key for every NWU students to display. Gambrill and Gibbs (2009) explain that critical thinking is the prudent scrutiny and evaluation of beliefs and actions to institute independent decisions, which was demonstrated by the students, as was evident from these comments:

'Yes, this project has allowed me to reflect on my own values as well as learn new values from others.' (Student 14, Post-excursion feedback, 13 September 2021)

'I learnt from so many other students what their view is on who and what a Health Hero should be, it was very interactive and the fact that we were able to work in groups with students across the campuses as well as fields of study made it that much better to take everyone's opinions and beliefs into consideration — which is
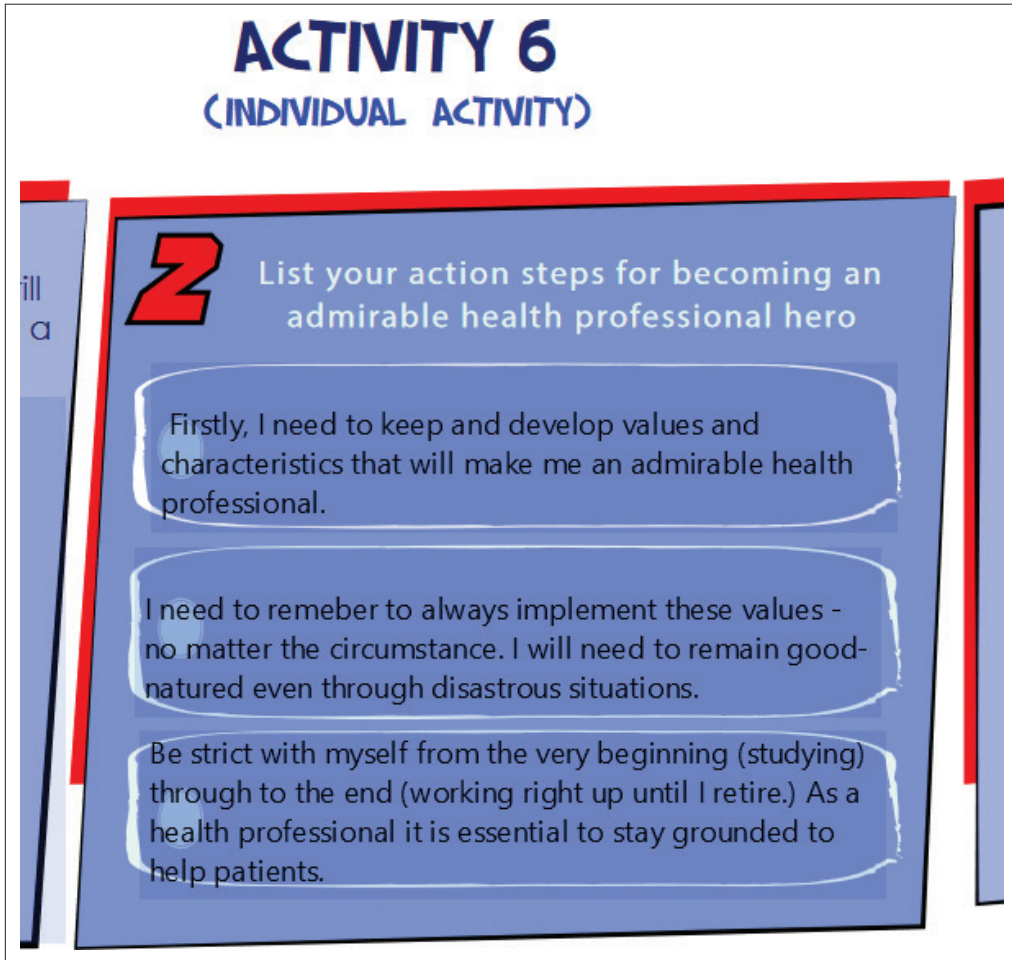
Source: Image design by M. Hanekom, published with permission by M. Hanekom.

FIGURE 13.7: Example of a student's action steps captured in the final activity of the Health Hero virtual excursion.

sometimes difficult when working online, but is made into a fun and motivational experience for many of us!' (Student 16, Post-excursion feedback, 13 September 2021)

'I gained much insight on what it takes to be a health professional.' (Student 26, Post-excursion feedback, 15 September 2021)

■ Discussion

The cyclic nature of design thinking precipitated clearly during the prototype phase, as the design team had to revisit some ideas and suggestions as the prototype was designed and tested. It was a continuous process of building, rethinking, redoing, and re-evaluation until the team was satisfied with the end product. This cyclic process was continually infused with the design

team's reflections. Shön (cited in Luka 2014:64) emphasised the role of reflection in design thinking. According to him, reflection is core to design work and should be included as part of the problem-solving process. Luka (2014:65) refers to design thinking as a reflective practice, a problem-solving activity, and a way of reasoning, with closely connected competences such as problem-solving, critical thinking, creativity, and development. These concepts were all captured in the design thinking process described in this chapter.

The design thinking process requires the development and demonstration of several critical competencies (Botha-Ravyse et al. 2018:5; Hasso Plattner Institute of Design 2021), which were also demonstrated by the design team during this project:

1. Navigate ambiguity – the ability to be open to different interpretations and to be comfortable with the knowledge that not everything is known. The ability to navigate ambiguity was evident as the process and product to be designed were unknown territory for most of the team members. Interestingly enough, Slater et al. (2020) made the comment that embracing ambiguity is one of the hardest lessons for healthcare educators to learn when implementing design thinking.

2. Learn from others – the ability to emphasise and accept diversity. The ability to empathise and embrace diversity was evident through the transdisciplinary approach with subject discipline experts, educational experts, and online design experts contributing to the project. Each of these experts brought unique knowledge, skills, and experiences to the table that contributed to a creative process of design and planning. In addition, the student population's diversity in terms of profession and background was a constant informing factor throughout the design process. Slater et al. (2020:116) motivate the appropriateness of implementing design thinking in healthcare education and industry because empathy is at the core of design thinking, a competency that should be central to patient care.

3. Synthesise information – the ability to understand information and order it in a way to gain insight and identify an opportunity. The ability to synthesise information was evident through the investigative approach followed by the team with continuous integration of new information and possibilities and making decisions based on the insight gained from the expert inputs.

4. Experiment rapidly – the ability to swiftly produce ideas in written, drawn, or built forms. This project required the team to think creatively, generating and testing ideas rapidly to produce a viable WIL project to be implemented in a short time.

5. Alternate between concrete and abstract – the ability to move between needs and ideas and to define ideas. The team was also able to move from concrete to abstract and back during the process of designing both the content and the virtual context for the project.

6. Build and craft purposefully – the ability to attentively make or construct ideas into palpable, shareable forms. The graphic designer contributed significantly to the success of the project by demonstrating the ability to create tangible content in the virtual environment based on the ideas and suggestions posted by the rest of the team.

7. Communicate purposefully – the ability to create and share stories, ideas, concepts, reflections, and learnings to a variety of audiences. The team focused on clear communication, not only during the design process but also in the designed virtual project, where different stories, ideas, concepts, reflections, and learnings were integrated to accommodate the diverse student group in health sciences.

8. Design – the ability to recognise a project as a design challenge and then to make decisions on people, tools, and techniques needed to tackle it. Ultimately, the design thinking approach resulted in a project where the people (transdisciplinary design team and students), tools, and techniques (software, graphic design skills) were combined successfully in the design of a virtual WIL excursion project for the health sciences first-year students.

The success of the design process can also be attributed to the transdisciplinary nature of the design team. Luka (2014) explains that design thinking involves collaboration on certain issues across disciplines. Each member of the transdisciplinary team brought unique experiences and expertise to the table that provided valuable insight into every stage of the design process, whether it was health science-specific information, online design innovation, educational principles, or the creative illustrations of the different health scenarios.

◼ Conclusion

The participation of students in this project's virtual excursion (as part of WIL) afforded them an opportunity to construct their own perceptions, knowledge, understanding, and professional identity as future health professionals to ensure their competency when they enter the workplace. This has helped our students to realise where they are and where they want to be.

As a transdisciplinary design team, we have learned that individuals perceive things differently and so do our students. We have also learned that cooperative behaviour instils working together, interaction, and new learning.

As a team, we realised that design thinking does not occur accidentally. As Slater et al. (2020:119) stated: design thinking 'requires devotion, dedication, careful planning, and thoughtful execution'.

This excursion was a pilot project aimed at exploring the possibility of engaging the first-year health sciences students in a virtual WIL experience to promote the development of an identity as a university student and especially as a health sciences student on a journey to become a professional

healthcare practitioner. The voluntary nature of the project resulted in an attrition of student participants as the project commenced. Should this virtual WIL excursion become part of all first-year Health Sciences students' orientation, participation will have to be linked to a credit-bearing module to motivate students to complete the programme. The project was designed and executed with a small group of students; however, should all the first-years be included, the management of the project may be challenging.

The topic of Health Hero can be expanded to include profession-specific scenarios. The current project focused on generic scenarios to enable as many students as possible to identify with the situation depicted in the different scenes. The virtual platform designed during this pilot project can be used as the framework on which more activities for more student groups can be linked.

Although the design team was interprofessional in nature, more health professions need to be represented, especially with the creation of profession-specific scenarios.

References

Preface

Cheng, S., Kuo, C., Lin, K. & Lee-Hsieh, J., 2010, 'Development and preliminary testing of a self-rating instrument to measure self-directed learning ability of nursing students', *International Journal of Nursing Studies* 47(9), 1152–1158. https://doi.org/10.1016/j.ijnurstu.2010.02.002

De Beer, J. & Henning, E., 2011, 'Retreating to a Vygotskian stage where pre-service teachers play out social, dramatical collisions', *Acta Academica* 43(4), 203–228.

De Beer, J., Petersen, N. & Dunbar-Krige, H., 2012, 'An exploration of the value of an educational excursion for pre-service teachers', *Journal of Curriculum Studies* 44(1), 89–110. https://doi.org/10.1080/00220272.2011.576771

Engeström, Y., 1987, *Learning by expanding: An activity-theoretical approach to developmental research*, Orienta-Konsultitl, Helsinki.

Hehr, K., 2014, 'Virtual field trips as an educational and motivational strategy to teach Iowa history', unpublished MSc dissertation, Iowa State University.

Hiemstra, R. & Brockett, R.G., 2012, 'Reframing the meaning of self-directed learning: An updated model', viewed 05 September 2019, https://newprairiepress.org/aerc/2012/papers/22.

Huizinga, J., 1955, *Homo ludens: A study of the play element in culture*, 1st Beacon Press paperback edn., Beacon Press, Boston, MA.

Klein, N., 2007, *The Shock Doctrine: The rise of disaster capitalism*, Knopf Publishers, Toronto.

Kounin, J., 1970, *Discipline and group management in classrooms*, Holt, Rinehart, and Winston, New York, NY.

Lortie, D., 1975, *Schoolteacher: A sociological study*, University of Chicago Press, Chicago, IL.

Notar, C.E. & Sorbet, S.R., 2020, 'Withitness in the e-learning', *Technium Social Sciences Journal* 10, 58–78. https://doi.org/10.47577/tssj.v10i1.1212

Petersen, N., De Beer, J. & Mentz, E., 2020, 'The first-year student teacher as a self-directed learner', in J. de Beer, N. Petersen & H.J. van Vuuren (eds.), *Becoming a teacher: Research on the work-integrated learning of student teachers* (NWU Self-Directed Learning Series Volume 4), pp. 115–155, AOSIS, Cape Town. https://doi.org/10.4102/aosis.2020.BK215.05

Rogoff, B., 1995, *Apprenticeship in thinking: Cognitive development in social context*, Harvard University Press, Cambridge, MA.

Sebotsa, T., Petersen, N. & Speight Vaughn, M., 2020, 'The role of work-integrated learning excursions in preparing student teachers for diverse classrooms and teaching social justice in South African classrooms', in J. de Beer, N. Petersen & H.J. van Vuuren (eds.), *Becoming a teacher: Research on the work-integrated learning of student teachers* (NWU Self-Directed Learning Series Volume 4), pp. 279–322, AOSIS, Cape Town. https://doi.org/10.4102/aosis.2020.BK215.10

Shulman, L.S., 2004, *The wisdom of practice*, Jossey-Bass, San Francisco, CA.

Sitte, W. & Wohlschlagal, H., 2001, *Didactic plays: Contributions for the teaching of geography and industrial studies instruction*, Institute for Geography and Regional Studies, University of Vienna, Vienna, Austria.

Taljaard, S., 2018, 'The value of an excursion in the professional development of pre-service teacher education students', Unpublished PhD thesis, University of Johannesburg.

Veresov, N., 2004, 'Zone of proximal development (ZPD): The hidden dimension?', in A. Ostern & R. Heila-Ylikallio (eds.), *Sprak som kultur* [Language as culture], vol. 1, pp. 13–30, Vasa Publishers, Richmond, BC.

Vygotsky, L., 1978, *Mind in society: The development of higher psychological processes*, Harvard University Press, Cambridge, MA.

Chapter 1

Baatjes, I.G., 2005, 'The neoliberal fantasy and the corporatisation of higher education in South Africa', *Quarterly Review of Education and Training in South Africa* 1(12), 25–33.

Balfour, R.J., 2021, *(Setting the scene) address to the guests and staff of the NWU at the future of teaching and learning colloquium. Crisis and continuity: From COVID-19 contingency to COVID continuity consensus planning for the future of teaching and learning at NWU*, viewed 22 February 2022, https://news.nwu.ac.za/sites/news.nwu.ac.za/files/files/Robert. Balfour/2021.08.23-Future-of-Teaching-Learning-at-NWU-Colloquium.pdf

Bergan, S., Gallagher, T., Harkavy, I., Munck, R. & Van't Land, H. (eds.), 2021, *Higher education's response to the COVID-19 pandemic: Building a more sustainable and democratic future*, Council of Europe Higher Education Series, vol. 25, Council of Europe, Strasbourg.

Council on Higher Education (CHE), 2013, 'A proposal for undergraduate curriculum reform in South Africa: The case for a flexible curriculum structure', in N. Ndebele (ed.), *Report of the task team on undergraduate curriculum structure*, Council on Higher Education, Pretoria.

Hartleb, T., 2008, 'Expect tight energy supply for four years', *Mail & Guardian*, viewed 22 August 2021, https://mg.co.za/article/2008-02-11-expect-tight-energy-supply-for-four-years/

Jansen, J., 2017, *As by fire: The end of the South African University*, Tafelberg, Cape Town.

Johnson, D.W. & Johnson, R.T., 2018, 'Cooperative learning: The foundation for active learning', in S.M. Brito (ed.), *Active learning – Beyond the future*, IntechOpen, viewed 26 September 2021, https://www.intechopen.com/chapters/63639.

Kajee, L. & Balfour, R.J., 2011, 'Students' access to digital literacy at a South African university: Privilege and marginalisation', *South African Journal of Applied Linguistics* 29(2), 187–196. https://doi.org/10.2989/16073614.2011.633365

Klein, N., 2007, *The shock Doctrine: The rise of disaster capitalism*, Knopf Publishers, Toronto.

Lehr, J.H., Keeley, J.W., Lehr, J.K, & Kingery, T.B., 2005, *Water Encyclopedia*, viewed 26 September 2021, http://books.google.com/books?id=gDlSAQAAIAAJ

Munck, R., 2021, 'Higher education, civic engagement COVID-19 and the "new" normal', in S. Bergan, T. Gallagher, I. Harkavy, R. Munck & H. van't Land (eds.), *Higher education's response to the COVID-19 pandemic: Building a more sustainable and democratic future*, pp. 31–40, Council of Europe Higher Education Series, vol. 25, Council of Europe, Strasbourg.

Napier, R. 2021, 'The challenges of the Covid-19 crisis for students', in S. Bergan, T. Gallagher, I. Harkavy, R. Munck & H. van't Land (eds.), *Higher education's response to the COVID-19 pandemic: Building a more sustainable and democratic future*, pp. 275–280. Council of Europe Higher Education Series, vol. 25, Council of Europe, Strasbourg.

North-West University (NWU), 2018, *North-West University's declaration on the decolonisation of university education: The imperative to transform teaching and learning, the research agenda and community engagement*, viewed 22 February 2002, https://news.nwu.ac.za/sites/news. nwu.ac.za/files/files/Robert.Balfour/2021_10_20%20AddressTLConference.pdf

Paton, C., 2021, 'Pandemic sows seeds of future inequality as pupils quit school', *Business Day*, 08 July, viewed 08 July 2021, https://www.businesslive.co.za/bd/national/education/2021-07-08-pandemic-sows-seeds-of-future-inequality-as-pupils-quit-school/

Pedder, D., 2006, 'Are small classes better? Understanding relationships between class size, classroom processes and pupils' learning', *Oxford Review of Education* 32(2), 213–234. https://doi.org/10.1080/03054980600645396

Regehr, C. & McCahan, S., 2020, 'Maintaining academic continuity in the midst of COVID-19', *Journal of Business Continuity & Emergency Planning* 4(2), 110–121.

Shoba, S., 2021, 'South Africa's literacy rates plunge deeper as learning time is lost', *The Daily Maverick*, 13 September, viewed 26 September 2021, https://www.dailymaverick.co.za/article/2021-09-13-south-africas-literacy-rates-plunge-deeper-as-learning-time-is-lost/

Solnit, R., 2020, 'The impossible has already happened: What coronavirus can teach us about hope', *The Guardian*, viewed 26 September 2021, https://www.theguardian.com/world/2020/apr/07/what-coronavirus-can-teach-us-about-hope-rebecca-solnit

Spaull, N. & Jansen, J.D. (eds.), 2019, *South African schooling: The enigma of inequality: A study of the present situation and future possibilities*, Springer, Cham.

Staff Writer, 2021, 'Top 9 universities in South Africa – and the best subjects to study at each', *BusinessTech*, viewed 22 August 2021, https://businesstech.co.za/news/lifestyle/513896/top-9-universities-in-south-africa-and-the-best-subjects-to-study-at-each/

Swanepoel, C., Yu, D. & Beukes, R., 2021, 'Why students don't attend lectures: What we found at a South African university', *The Conversation*, 06 October, viewed 09 October 2021, https://theconversation.com/why-students-dont-attend-lectures-what-we-found-at-a-south-african-university-168534

Tella, Q. & Motala, S., 2021, *From ivory towers to ebony towers: Transforming humanities curricula in South Africa, Africa and African American studies*, Fanele (Jacana) Publishers, Johannesburg.

The Economist, 2020, *Digital classrooms: Educational technology is coming of age during the pandemic*, viewed 22 April 2022, https://www.economist.com/international/2020/11/11/educational-technology-is-coming-of-age-during-the-pandemic

Vally, S., 2007, 'From people's education to neo-liberalism in South Africa', *Review of African Political Economy* 34(111), 39–56. https://doi.org/10.1080/03056240701340258

Wikipedia, 2021, *South African Energy Crisis*, viewed 22 August 2021, https://en.wikipedia.org/wiki/South_African_energy_crisis

Chapter 2

Andruske, C.L., 2000, 'Self-directed learning as a political act: Learning projects of women on welfare', *Proceedings of the Adult Education Research Conference*, viewed n.d., http://newprairiepress.org/aerc/2000/papers/3

Barrows, H.S., 1984, 'A specific, problem-based, self-directed learning method designed to teach medical problem-solving skills, self-learning skills and enhance knowledge retention and recall', in H.G. Schmidt & M.L. De Volder (eds.), *Tutorials in problem-based learning*, Van Gorcum, Assen.

Boughey, C. & Niven, P., 2012, 'The emergence of research in the South African academic development movement', *Higher Education Research & Development* 31(5), pp. 641–653.

Cheng, S.-F., Kuo, C.-L., Lin, K.-C. & Hsieh, J., 2010, 'Development and preliminary testing of a self-rating instrument to measure self-directed learning ability of nursing students', *International Journal of Nursing Studies* 47(9), 1152–1158. https://doi.org/10.1016/j.ijnurstu.2010.02.002

Croft, N., Dalton, A. & Grant, M., 2015, 'Overcoming isolation in distance learning: building a learning community through time and space', *Journal for Education in the Built Environment* 5(1), 27–64. https://doi.org/10.11120/jebe.2010.05010027

De Beer, K.J., 2006, 'Open access, retention and throughput at the Central University of Technology', *South African Journal of Higher Education* 20(1), 31–45. https://doi.org/10.4314/sajhe.v20i1.25556

De Beer, J., 2019, 'The importance of context for self-directed learning', in E. Mentz, J. de Beer & R. Bailey (eds.), *Self-Directed Learning for the 21st Century: Implications for Higher Education* (NWU Self-Directed Learning Series Volume 1), pp. 103–131, AOSIS, Cape Town. https://doi.org/10.4102/aosis.2019.BK134.04

De Beer, J. & Henning, E., 2011, 'Retreating to a Vygotskian stage where pre-service teachers play out social dramatical collisions', *Acta Academica* 43(4), 1–25.

De Beer, J., Petersen, N. & Dunbar-Krige, H., 2012, 'An exploration of the value of an educational excursion for pre-service teachers', *Journal of Curriculum Studies* 44(10), 89–110. https://doi.org/10.1080/00220272.2011.576771

Grace, A.P., 1996, 'Taking a critical pose: Andragogy – Missing links, missing values', *International Journal of Lifelong Education* 15(5), 382–392. https://doi.org/10.1080/0260137960150506

Harris, B.A., 2006, 'The importance of creating a sense of community', *Journal of College Student Retention* 8(1), 83–105. https://doi.org/10.2190/AMNM-2VKP-V6MH-D1GF

Hausman, L.R.M., Schofield, J.W. & Woods, R.L., 2007, 'Sense of belonging as a predictor of intentions to persist among African American and white first year college students', *Research in Higher Education* 48(7), 803–839. https://doi.org/10.1007/s11162-007-9052-9

Heverly, M.A., 1999, 'Predicting retention from students' experiences with college processes', *Journal of College Student Retention* 1(1), 3–11. https://doi.org/10.2190/C1MB-YP0J-UHJ0-MGMB

Hiemstra, R. & Brockett, R.G., 2012, 'Reframing the meaning of self-directed learning: An updated model', *Adult Education Research Conference*, viewed n.d., https://newprairiepress.org/aerc/2012/papers/22.

Huizinga, J., 1955, *Homo Ludens: A study of the play element in culture*, 1st Beacon Press paperback edn., Beacon Press, Boston, MA.

Johnson, D. & Johnson, R., 2008, *Cooperation in the classroom*, Interaction Book Company, Edina, MN.

Loyens, S.M., Magda, J. & Rikers, R.M., 2008, 'Self-directed learning in problem-based learning and its relationships with self-regulated learning', *Educational Psychology Review* 20, 411–427. https://doi.org/10.1007/s10648-008-9082-7

Merriam, S.B., 2001, 'Andragogy and self-directed learning: Pillars of adult learning theory', *New Directions for Adult and Continuing Education* 89(Spring 2001), 3–13. https://doi.org/10.1007/s10648-008-9082-7

Mingo, W.D., 2013, *The effects of applying authentic learning strategies to develop computational thinking skills in computer literacy students*, viewed n.d., https://eric.ed.gov/?id=ED552990.

Morrow, W.E., 2009, *Bounds of democracy: Epistemological access in higher education*, HSRC Press, Cape Town.

Nasri, N.M. & Mansor, A N., 2016, 'Teacher educators' perspectives on the sociocultural dimensions of self-directed learning', *Creative Education* 7, 2755–2773. https://doi.org/10.4236/ce.2016.718257

North-West University (NWU), 2020a, *North-West University teaching and learning strategy, 2020*, viewed 20 September 2021, http://www.nwu.ac.za/sites/www.nwu.ac.za/files/files/i-governance-management/documents/T%26L-Strategy-2021-2025.pdf.

North-West University (NWU), 2020b, *NWU integrated annual report, 2020*, viewed 12 November 2021, https://www.nwu.ac.za/sites/www.nwu.ac.za/files/files/i-institutional-information/annual-report/IR-2020/Intgrated-Report-2020_small.pdf.

Plomp, T. & Nieveen, N. (eds.), 2010, *An introduction to educational design research*, 3rd edn., Netzodruk, Enschede.

Pretorius, C., 2017, *The story of the NWU's first ten years*, North-West University, Potchefstroom.

Prinsloo, P.J.J., 2016, *North-West University (NWU): A merger and incorporation story, 2004–2014*, North-West University, Potchefstroom.

Saldaña, J., 2009, *The coding manual for qualitative researchers*, Sage, London.

Strydom, F. (ed.), 2017, *Engaging students: Using evidence to promote student success*, African Sun Media, Bloemfontein.

Taljaard, S., 2018, 'The value of an excursion in the professional development of preservice teacher education students', PhD thesis, University of Johannesburg.

Tinto, V., 1987, 'The principles of effective retention', *Fall conference of the Maryland College Personnel Association*, 20 November 1987, viewed 18 July 2008, http://www.eric.ed.gov/ERICWebPortal/custom/portlets/recordDetails/detailmini.jsp?_nfpb=true&_&ERICExtSearch_SearchValue_0=ED301267&ERICExtSearch_SearchType_0=no&accno=ED301267.

Van Zyl, A., 2010, 'The predictive value of pre-entry attributes for student academic performance in the South African context', Unpublished PhD thesis, University of Johannesburg.

Veresov, N., 2004, 'Zone of proximal development (ZPD): The hidden dimension?', in A. Ostern & R. Heila-Ylikallio (eds.), *Sprak som kultur – brytningar I tid och rum. – Language as culture – tensions in time and space*, vol. 1, pp. 13–30, Vasa, s.l.

Chapter 3

Athiemoolan, L., 2018, 'The value of drama-in-education as a decolonizing pedagogy through embodied drama strategies in a higher education classroom', *Journal of Education* 72, 55–72. https://doi.org/10.17159/2520-9868/i72a04

Ball, D.L., Sleep, L., Boerst, T. & Bass, H, 2009, 'Combining the development of practice and the practice of development in teacher education', *Elementary School Journal* 109(5), 458–474. https://doi.org/10.1086/596996

Barrows, H.S., 1984, 'A specific, problem-based, self-directed learning method designed to teach medical problem-solving skills, self-learning skills and enhance knowledge retention and recall', in H.G. Schmidt & M.L. De Volder (eds.), *Tutorials in problem-based learning*, pp. 3–12, Van Gorcum, Assen.

Cheng, S.-F., Kuo, C., Lin, K.C. & Lee-Hsieh, J., 2010, 'Development and preliminary testing of a self-rating instrument to measure self-directed learning ability of nursing students', *International Journal of Nursing Studies* 47(9), 1152–1158. https://doi.org/10.1016/j.ijnurstu.2010.02.002

Craven, M.M., 2020, *Syncing with students: Valuable qualities of synchronous online teaching*, viewed 01 September 2021, https://www.facultyfocus.com/articles/online-education/online-student-engagement/syncing-with-students-valuable-qualities-of-synchronous-online-teaching/.

De Beer, J. & Henning, E., 2011, 'Retreating to a Vygotskian stage where pre-service teachers play out social dramatical collisions', *Acta Academica* 43(4), 1–25.

De Beer, J., Petersen, N. & Dunbar-Krige, H., 2012, 'An exploration of the value of an educational excursion for pre-service teachers', *Journal of Curriculum Studies* 44(1), 89–110. https://doi.org/10.1080/00220272.2011.576771

De Beer, J., Van der Walt, M. & Bunt, B., 2020, 'The affordances of case-based teaching that draws on drama in pre-service teacher education', in J. De Beer, N. Petersen & H. Van Vuuren (eds.), *Becoming a teacher: Research on the work-integrated learning of student teachers* (NWU Self-Directed Learning Series Volume 4), pp. 189–213 AOSIS, Cape Town. https://doi.org/10.4102/aosis.2020.BK215.07

Fiock, H., 2020, 'Designing a community of inquiry in online courses', *International Review of Research in Open and Distributed Learning* 21(1), 135–152. https://doi.org/10.19173/irrodl.v20i5.3985

Geertz, C., 1973, 'Thick description: Toward an interpretative theory of culture', in C. Geertz (ed.), *The interpretation of cultures*, pp. 3–30, Basic Books, New York, NY.

Huizinga, J., 1955, *Homo Ludens: A study of the play element in culture*, 1st Beacon Press paperback edn., Beacon Press, Boston, MA.

LaHayne, S.P., 2019, '4 ways social-emotional learning can create safe school spaces for all students', *EdWeek Market Brief*, viewed 16 November 2021, https://marketbrief.edweek.org/the-startup-blog/4-ways-social-emotional-learning-can-create-safe-school-spaces-for-students/.

Lampert, M., 2010, 'Learning teaching in, from, and for practice: What do we mean?', *Journal of Teacher Education* 61(1–2), 21–34. https://doi.org/10.1177/0022487109347321

Lave, J., 1993, 'Situating learning in communities of practice', in L.B. Resnick, J.M. Levine & S.D. Teasley (eds.), *Perspectives on socially shared cognition*, pp. 63–82, American Psychological Association, Washington, DC.

Lortie, D., 1975, *Schoolteacher: A sociological study*, University of Chicago Press, London.

Loyens, S.M., Magda, J. & Rikers, R.M., 2008, 'Self-directed learning in problem-based learning and its relationships with self-regulated learning', *Educational Psychology Review* 20, 411–427. https://doi.org/10.1007/s10648-008-9082-7

Mannion, G., Fenwick, A. & Lynch, J., 2013, 'Place-responsive pedagogy: Learning from teachers' experiences of excursions in nature', *Environmental Education Research* 19(6), 792–809. https://doi.org/10.1080/13504622.2012.749980

Mentz, E. & De Beer, J., 2021, 'Cultural-historical activity theory as a lens in mixed-methods research on self-directed learning', *South African Journal of Higher Education* 35(5), 163–184. https://doi.org/10.20853/35-5-4364

Paul, J. & Jefferson, F., 2019, 'A comparative analysis of student performance in an online vs. face-to-face environmental science course', *Frontiers in Computer Science* 1(7), 1–9. https://doi.org/10.3389/fcomp.2019.00007

Petersen, N., De Beer, J. & Mentz, E., 2020, 'The first-year student teacher as a self-directed learner', in J. de Beer, N. Petersen & H. van Vuuren (eds.), *Becoming a teacher: Research on the work-integrated learning of student teachers* (NWU Self-Directed Learning Series Volume 4), pp. 115–156, AOSIS, Cape Town. https://doi.org/10.4102/aosis.2020.BK215.05

Saldaña, J., 2009, *The coding manual for qualitative researchers*, Sage, London.

Schön, D.A., 1987, *Educating the reflective practitioner*, Jossey Bass, San Francisco, CA.

Sebotsa, T., Petersen, N. & Speight Vaughn, M., 2020, 'The role of work-integrated learning excursions in preparing student teachers for diverse classrooms and teaching social justice in South African classrooms', in J. de Beer, N. Petersen & H. van Vuuren (eds.), *Becoming a teacher: Research on the work-integrated learning of student teachers* (NWU Self-Directed Learning Series Volume 4), pp. 279–322, AOSIS, Cape Town. https://doi.org/10.4102/aosis.2020.BK215.10

Shulman, J.H., 2002, 'Happy accidents: Cases as opportunities for teacher learning', paper presented at the annual meeting of the American Educational Research Association, New Orleans, LA, United States of America, April 01–05, 2002, n.p.

Taljaard, S., 2018, 'The value of an excursion in the professional development of preservice teacher education students', Unpublished PhD thesis, University of Johannesburg.

Veresov, N., 2004, 'Zone of proximal development (ZPD): The hidden dimension?', in A. Ostern & R. Heila-Ylikallio (eds.), *Sprak som kultur – brytningar I tid och rum. – Language as culture – tensions in time and space*, vol. 1, pp. 13–30, Vasa Publishers, s.l.

Veresov, N., 2007, 'Sign mediation: Magic triangle: Sign-mediated action', paper presented at ISCAR conference 2007, fourth Nordic conference on cultural and activity research, Oslo, Norway, June 15–17, 2007, n.p.

Vygotsky, L.S., 1983, *Sobraniye Sochinenii* [Collected Works], vol 5. Pedagogica Publisher, Moscow.

Vygotsky, L.S., 1935, *Umstvennoe razvitie detei v protsesse obuchenia*, Gosudarstvennoe Uchebno-pedagogicheskoe izdatelstvo, Moscow.

Vygotsky, L.S., [1933] 1966, 'Igra I ee rol v psihicheskom razvitii rebenka [Play and its role in the mental development of the child]', *Voprosy psihologii [Questions in Psychology]* 6, 62–76.

Vygotsky, L.S., 1978, *Mind in society: The development of higher psychological processes*, in transl. M. Cole, V. John-Steiner, S. Scribner & E. Souberman (eds.), Harvard University Press, Cambridge, MA.

Vygotsky, L.S., 1986, *Thought and language*, MIT Press, Cambridge, MA.

Wenger, E., 2003, 'Communities of practice and social learning systems', in D. Nicolini, S. Gherardi & D. Yanow (eds.), *Learning in organizations*, pp. 76–99, M.E. Sharpe, Armonk, NY.

Whitelaw, S., 2007, 'Novice teachers in a social context: Enculturation in a pseudocommunity of practitioners', Unpublished PhD thesis, University of Johannesburg.

Chapter 4

Balfour, R.J., 2021, '(Setting the scene) address to the guests and staff of the NWU at the future of teaching and learning colloquium. Crisis and continuity: From Covid-19 contingency to Covid continuity consensus planning for the future of teaching and learning at NWU', Address by Prof RJ Balfour, DVC Teaching and Learning, North-West University, viewed 22 February 2022,

https://news.nwu.ac.za/sites/news.nwu.ac.za/files/files/Robert.Balfour/2021.08.23-Future-of-Teaching-Learning-at-NWU-Colloquium.pdf

Bandy, J., 2011, *What is Service-Learning or community engagement?*, Vanderbilt University Center for Teaching, viewed 24 October 2021, https://cft.vanderbilt.edu/guides-sub-pages/teaching-through-community-engagement/.

Barton, T., 2019, *Service-Learning vs. community service: Why all schools need a Service-Learning program now!*, viewed 24 October 2021, https://servelearn.co/blog/Service-Learning-vs-community-service/

Bell, J., Dicker, R., Garcia, M., Kelly, E., Streich, R., Mulrooney, H. et al., 2019, 'Active learning across disciplines: Opportunities to develop employability skills and leadership potential in undergraduate students. A student as staff perspective', *New Directions in the Teaching of Physical Sciences* 14(1), n.p. https://doi.org/10.29311/ndtps.v0i14.3048

Bitzer, E. & Withering, M., 2020, 'Graduate attributes: How some university students experience and learn them', *South African Journal in Higher Education* 34(3), 13–31. https://doi.org/10.20853/34-3-3504

Brophy, J., 1988, 'Educating teachers about managing classrooms and students', *Teaching and Teacher Education* 4(1), 1–18. https://doi.org/10.1016/0742-051X(88)90020-0

Cloete, E. & Erasmus, M., 2012, 'Service-Learning as part of tertiary music programmes in South Africa: A framework for implementation', *Journal of the Musical Arts in Africa* 9(2012), 1–22. https://doi.org/10.2989/18121004.2012.736143

Cochran-Smith, M., 2015, 'Keeping teaching complex: Policy, research and practice', *Venue* 4(2), 1–7. https://doi.org/10.3384/venue.2001-788X.15411

Council for Higher Education (CHE), 2007, *HEQC institution audits manual*, Council of Higher Education, Pretoria.

De Beer, J. & Mentz, E., 2016, 'Self-directed learning: Lessons from indigenous knowledge holders for school science education', *7th International conference, ISTE 2016 proceedings*, Mopani Camp in the Kruger National Park, South Africa, October 23–28, pp. 546–556.

Department of Education, 1997, *Education White Paper 3: A programme for higher education transformation*, Department of Education, Pretoria.

Department of Higher Education, 2013, *White Paper for post school education and training: Building an expanded, effective and integrated post school post-school system*, Department of Higher Education and Training, Pretoria.

Dewey, J., 1916, *Democracy and education. An introduction to the philosophy of education*, 1966 edn., Free Press, New York, NY.

Engeström, Y., 1987, *Learning by expanding: An activity-theoretic approach to developmental research*, Orienta-Konsultit Oy, Helsinki.

Engeström, Y., 1999, 'Activity theory and individual and social transformation', in Y. Engeström, R. Miettinen & R.-L. Punamaki (eds.), *Perspectives on activity theory,* pp. 19–38, Cambridge University Press, Cambridge.

Engeström, Y., 2001, 'Expansive learning at work: Toward an activity theoretical reconceptualisation', *Journal of Education and Work* 14(1), 133–156. https://doi.org/10.1080/13639080020028747

Engeström, Y. & Sannino, A., 2010, 'Studies of expansive learning: Foundations, findings and future challenges', *Educational Research Review* 5(1), 1–24. https://doi.org/10.1016/j.edurev.2009.12.002

Furco, A., 1996, 'Service-Learning: A balanced approach to experiential education', *Expanding boundaries: Serving and learning* 1, 1–6. http://www.sciepub.com/reference/220721

Häkkinen, P., Järvelä, S., Mäkitalo-Siegl, K., Ahonen, A., Näykki, P. & Teemu, V., 2017, 'Preparing teacher-students for twenty-first-century learning practices (PREP 21): A framework for enhancing collaborative problem-solving and strategic learning skills', *Teachers and Teaching* 23(1), 25–41. https://doi.org/10.1080/13540602.2016.1203772

Hardman, J., 2008, 'Researching pedagogy: An activity theory approach', *Journal of Education* 45, 65–95.

Heffernan, K., 2001, *Fundamentals of Service-Learning course construction*, Campus Compact, Brown University, Providence, RI, viewed 21 November 2021, https://opensiuc.lib.siu.edu/cgi/viewcontent.cgi?article=1160&context=jcwre.

Horishna, N., Slozanska, H., Soroka, O. & Romanovska, L., 2019, 'Exploring the leadership skills of pre-service social work students: Implications for social work education', *Problems of Education in the 21st Century* 77(5), 598–615. https://doi.org/10.33225/pec/19.77.598

Huda, M., Teh, K.S.M., Muhamad, N.H.N. & Nasir, B.M., 2018, 'Transmitting leadership based civic responsibility: Insights from Service-Learning', *International Journal of Ethics and Systems* 34(1), 20–31. https://doi.org/10.1108/IJOES-05-2017-0079

İlin, G, 2020, 'Reflection or description: A document analyses of ELT student teachers' reflective journals', *Journal of Language and Linguistic Studies* 16(2), 1019–1031.

Jamwal, B.S., 2012, 'Teacher education: Issues and their remedies', *International Journal of Educational Planning and Administration* 2(2), 85–90.

Johnson, D.W. & Johnson, R.T., 2009, 'An educational psychology success story: Social interdependence theory and cooperative learning', *Educational Researcher* 38(5), 365–379. https://doi.org/10.3102/0013189X09339057

Jones, V., 2006, 'How do teachers learn to be effective classroom managers?', in C.M. Evertson & C.S. Weinstein (eds.), *Handbook of classroom management: Research, practice and contemporary issues*, pp. 887–908, Lawrence Erlbaum Associates, Mahwah, NJ.

Kaptelinin, V., 2005, 'The object of activity: Making sense of the sense-maker', *Mind, Culture, and Activity* 12(1), 4–18. https://doi.org/10.1207/s15327884mca1201_2

Knowles, M., 1975, *Self-directed learning: A guide for learners and teachers*, Pearson Learning Group, Cambridge.

Leontiev, A.N., 1978, *Activity, consciousness, and personality*, Prentice Hall, Englewood Cliffs, NJ.

Mathewson Mitchell, D. & Reid, J., 2017, '(Re)turning to practice in teacher education: Embodied knowledge in learning to teach', *Teachers and Teaching* 23(1), 42–58. https://doi.org/10.1080/13540602.2016.1203775

Mavuru, L. & Ramnarain, U.D., 2020, 'Language affordances and pedagogical challenges in multilingual Grade 9 natural sciences classrooms in South Africa', *International Journal of Science Education* 42(14), 2472–2492. https://doi.org/10.1080/09500693.2019.1655177

Nadelson, L.S., Booher, L. & Turley, M., 2020, 'Leaders in the classroom: Using teaching as a context for measuring leader identity', *Frontiers in Education* 5, 525630. https://doi.org/10.3389/feduc.2020.525630

North-West University (NWU), 2020, *Teaching and learning strategy 2021–2025*, North-West University, Potchefstroom.

North-West University (NWU), 2021, *Community engagement policy*, North-West University, Potchefstroom.

Ogawa, R.T., Crain, R., Loomis, M. & Ball, T., 2008, 'CHAT-IT: Toward conceptualizing learning in the context of formal organizations', *Educational Researcher* 37(2), 83–98. https://doi.org/10.3102/0013189X08316207

Olteanu, C., 2017, 'Reflecting for action and the choice or design of examples in the teaching of mathematics', *Mathematics Education Research Journal* 29(3), 349–367. https://doi.org/10.1007/s13394-017-0211-9

Osman, R. & Petersen, N., 2010, 'Students' engagement with engagement: The case of teacher education students in higher education in South Africa', *British Journal of Educational Studies* 58(4), 407–419. https://doi.org/10.1080/00071005.2010.527665

Petersen, N., Gravett, S. & Ramsaroop, S., 2020, 'Service-Learning and teacher education', in *Oxford research encyclopaedia of education*, viewed 23 October 2021, from https://doi.org/10.1093/acrefore/9780190264093.013.1002

Petersen, N. & Henning, E., 2018, 'Service-Learning and the practice of social justice and care', *Journal of Human Behaviour in the Social Environment* 28(4), 436–448.

Petersen, N. & Petker, N., 2017, 'Teacher education students' struggles with group work in Service-Learning', *South African Journal of Childhood Education* 7(1), a479. https://doi.org/10.4102/sajce.v7i1.479

Ramsaroop, S. & Petersen, N., 2020, 'Building professional competencies through a Service-Learning 'Gallery Walk' in primary school teacher education', *Journal of University Teaching & Learning Practice* 17(4), 3. https://doi.org/10.53761/1.17.4.3

Rani, A., 2017, 'Problems and solutions of teacher education', *International Journal of Academic Research in Education and Review* 5(1), 15–19.

Rogoff, B., 1995, 'Observing sociocultural activity on three planes: Participatory appropriation, guided participation, and apprenticeship', in J.V. Wertch, P. Del Rio & A. Alvarez (eds.), *Sociocultural studies of mind*, pp. 139–164, Cambridge University Press, Cambridge.

Rusznyak, L., 2016, 'Making conceptual connections visible to students in professional programmes: The case of initial teacher education', *South African Journal of Higher Education* 30(2), 205–225. https://doi.org/10.20853/30-2-576

Saldaña, J., 2013, *The coding manual for qualitative researchers*, Sage, London.

Samuelsson, M. & Gunnel Colnerud, G., 2015, 'Student44teachers' perceptions regarding the challenges of leadership', in D. Garbett & A. Ovens (eds.), *Teaching for tomorrow today*, pp. 312–320, International Association of Teachers and Teaching (ISATT), Tilburg University, Tilburg.

Schön, D., 1983, *The reflective practitioner: How professionals think in action*, Basic Books, New York, NY.

Thompson, S. & Thompson, N., 2008, *The critically reflective practitioner*, Palgrave MacMillan, Hampshere.

Veresov, N., 2004, 'Zone of proximal development (ZPD): The hidden dimension', *Development* n.v., 42–48.

Vygotsky, L.S., 1978, *Mind in society*, Harvard University Press, London.

Wagner, T., 2014, *The global achievement gap: Why even our best schools don't teach the new survival skills our children need – and what we can do about it*, 2nd edn., Perseus Books, New York, NY.

Western Governors University, 2021, *What is adaptive leadership?*, viewed 15 March 2022, www.wgu.edu/blog/what-adaptive-leadership2101WhatIsAdaptiveLeadership

Yukl, G. & Mashud, M., 2010, 'Why flexible and adaptive leadership is essential', *Consulting Psychology Journal: Practice and Research* 62(2), 81–93. https://doi.org/10.1037/a0019835

Chapter 5

Arends, D. & Petersen, N., 2018, 'The role of first-year experience excursion in promoting social integration at university: Student teachers' views', *South African Journal of Childhood Education* 8(1), 1–9. https://doi.org/10.4102/sajce.v8i1.543

Astuti, A., Aziz, A., Sumarti, S. & Bharati, D., 2019, 'Preparing 21st century teachers: Implementation of 4C character's pre-service teacher through teaching practice', *Journal of Physics: Conference Series* 1233, 012109. https://doi.org/10.1088/1742-6596/1233/1/012109

Borg, M., 2004, 'The apprenticeship of observation', *ELT* 58(3), 274–276. https://doi.org/10.1093/elt/58.3.274

Botha, C., 2020, 'The impact of the apprenticeship of observation on preservice teachers' perceptions of teaching', *Journal of Education* 81, 50–64. https://doi.org/10.17159/2520-9868/i81a03

Buchanan, J., Prescott, A., Schuck, S., Aubusson, P., Burke, P. & Louviere, J., 2013, 'Teacher retention and attrition: Views of early career teachers', *Australian Journal of Teacher Education* 38(3), 112–129. https://doi.org/10.14221/ajte.2013v38n3.9

Centre for Development and Enterprise, 2015, *Teachers in South Africa: Supply and demand 2013–2025. Executive summary*, Centre for Development and Enterprise, Johannesburg.

Cheng, S., Kuo, C., Lin, K. & Lee-Hsieh, J., 2010, 'Development and preliminary testing of a self-rating instrument to measure self-directed learning ability of nursing students', *International Journal of Nursing Studies* 47(9), 1152–1158. https://doi.org/10.1016/j.ijnurstu.2010.02.002

Cleveland-Innes, M. & Campbell, P., 2012, 'Emotional presence, learning and the online learning environment', *The International Review of Research in Open and Distance Learning* 13(4), 269–292. https://doi.org/10.19173/irrodl.v13i4.1234

Conner, J. & Vary, G., 2017, 'Confronting apprenticeships of observation: How student-faculty pedagogical partnership complicates conceptualization, understanding, and practice of effective pedagogy', *International Journal for Students as Partners* 1(1), 1–6. https://doi.org/10.15173/ijsap.v1i1.3179

Cordeiro, M. & Kelly, L., 2019, 'Research paradigm and why pragmatism worked for us', *Development-Humanitarian Research Group, Deakin*, viewed 01 November 2021, https://blogs.deakin.edu.au/devt-hum/2019/12/02/on-selecting-a-research-paradigm-and-why-pragmatism-worked-for-us/

De Beer, J. & Henning, E., 2011, 'Retreating to a Vygotskyan stage where pre-service teachers play out social "dramatical collisions"', *Acta Academia* 43(4), 1–26.

De Beer, J., Petersen, N. & Dunbar-Krige, H., 2012, 'An exploration of the value of an educational excursion for pre-service teachers', *Journal of Curriculum Studies* 44(1), 89–110. https://doi.org/10.1080/00220272.2011.576771

Den Brok, P., Wubbels, T. & Van Tartwijk, J., 2017, 'Exploring beginning teachers' attrition in the Netherlands', *Teachers and Teaching Theory and Practice* 23(8), 1–115. https://doi.org/10.1080/13540602.2017.1360859

Engeström, Y., 1987, *Learning by expanding: An activity-theoretical approach to developmental research*, Orienta-Konsultitl, Helsinky.

García, E. & Weiss, E., 2019, *U.S. schools struggle to hire and retain teachers*, Economic Policy Institute, Washington, DC.

Good, T.L. & Lavigne, A.L., 2018, *Looking in classrooms*, 11th edn., Routledge, New York, NY.

Gravett, S., 2012, 'Crossing the "Theory-practice divide": Learning to be(come) a teacher', *South African Journal of Childhood Education* 2(2), 1–14. https://doi.org/10.4102/sajce.v2i2.9

Guglielmino, L.M., 1978, 'Development of the self-directed learning readiness scale', PhD thesis, University of Georgia.

Henschke, J., 2016, 'Self-directed learning (SDL) and andragogy: My take on their contrasting and complementary relationship', in *Symposium of the International Association for Self-Directed Learning. IACE Hall of Fame Repository*, viewed 31 October, 2021, http://trace.tennessee.edu/utk_IACE-browseall/477/

Hong, J.Y., 2010, 'Pre-service and beginning teachers' professional identity and its relation to dropping out of the profession', *Teaching and Teacher Education* 26(8), 1530–1543. https://doi.org/10.1016/j.tate.2010.06.003

Howell, P.B., 2012, 'Conceptualizing developmentally responsive teaching in early field experiences', *Middle Grades Research Journal* 7(4), 43–55.

Hugo, J.P., 2018, 'The development and implementation of an effective mentoring programme to improve job satisfaction among beginner teachers at primary schools in the Mpumalanga Province of South Africa', unpublished PhD thesis, University of South Africa, viewed 30 October 2021, http://hdl.handle.net/10500/24842.

Huizinga, J., 1955, *Homo Ludens: A study of the play element in culture*, 1st Beacon Press paperback edn., Beacon Press, Boston, MA.

International Society for Self-Directed Learning, 2021, *About us*, viewed 31 October 2021, from https://www.sdlglobal.com/about-us

Johnson, D. & Johnson, R., 1994, *An overview of cooperative learning*, viewed 28 October 2019, http://digsys.upc.es/ed/general/Gasteiz/docs_ac/Johnson_Overview_of_Cooperative_Learning.pdf

Johnson, R. & Onwuegbuzie, A.J., 2004, 'Mixed methods research: A research paradigm whose time has come', *Educational Researcher* 33(7), 14–26. https://doi.org/10.3102/0013189X033007014

Kaushik, V. & Walsh, C.A., 2019, 'Pragmatism as a research paradigm and its implications for social work research', *Social Sciences* 8(9), 255. https://doi.org/10.3390/socsci8090255

Kim, S., Raza, M. & Seidmen, E., 2019, 'Improving 21st-century teaching skills: The key to effective 21st century learners', *Research in Comparative & International Education* 14(1), 99–117. https://doi.org/10.1177/1745499919829214

Knowles, M., 1975, *Self-directed learning: A guide for learners and teachers*, Prentice Hall, Englewood Cliffs, NY.

Knowles, M.S., 1984, *Andragogy in action: Applying modern principles of adult learning*, Jossey-Bass Inc., San Francisco, CA.

Koo, K., Baker, I. & Yoon, J., 2021, 'The first year of acculturation: A longitudinal study on acculturative stress and adjustment among first-year international college students', *Journal of International Students* 11(2), 278–298. https://doi.org/10.32674/jis.v11i2.1726

Leather, M., Harper, M. & Obee, P., 2021, 'A pedagogy of play: reasons to be playful in postsecondary education', *Journal of Experiential Education* 44(3), 208–226. https://doi.org/10.1177/1053825920959684

Lortie, C.D., 1975, *Schoolteacher: A sociological study*, University of Chicago Press, Chicago, IL.

Mardell, B., Wilson, D., Ryan, J., Ertel, K., Krechevsky, M. & Baker, M., 2016, *Towards a pedagogy of play*, A Project Zero Working Paper, viewed 30 October 2021, http://www.pz.harvard.edu/projects/pedagogy-of-play.

McNeil, L.M., 2013, *Contradictions of control: School structure and school knowledge*, Routledge, London.

Mentz, E. & De Beer, J., 2019, 'The use of cultural-historical activity theory in researching the affordances of indigenous knowledge for self-directed learning', in J. De Beer (ed.), *The decolonisation of the curriculum project: The affordances of indigenous knowledge for self-directed learning* (NWU Self-directed Learning Series Volume 2), pp. 49–86, AOSIS, Cape Town. https://doi.org/10.4102/aosis.2019.BK133.03

Mentz, E. & De Beer, J., 2021, 'Cultural-historical activity theory as a lens in mixed methods research on self-directed learning', *South African Journal of Higher Education* 35(5), 163–183.

Moodie, I., 2016, 'The anti-apprenticeship of observation: How negative prior language learning experience influences English language teachers' beliefs and practices', *System* 60, 29–41. https://doi.org/10.1016/j.system.2016.05.011

NWU Department Strategic Intelligence, 2021, *Apps*, viewed 09 November 2021, https://app.powerbi.com/groups/me/apps/47c5a8b6-46c3-4a81-bb45-a9a2eca7d617/reports/649deba4-65d5-4e78-a0e0-a4bdf24ebc2a/ReportSection97c32e6b8870e2dcd530?ctid=331c86e7-d032-436f-bc53-f2552d031012.

Petersen, N., De Beer, J. & Mentz, E., 2020, 'The first-year student teacher as a self-directed learner', in J. de Beer, N. Petersen & H. van Vuuren (eds.), *Becoming a teacher: Research on the work-integrated learning of student teachers* (NWU Self-Directed Learning Series Volume 4), pp. 115–152, AOSIS, Cape Town. https://doi.org/10.4102/aosis.2020.BK215.05

Saldaña, J., 2009, *The coding manual for qualitative researchers*, Sage, London.

Setlhodi, I., 2019, 'The value of pacing in promoting self-directed learning', in F.G. Giuseffi (ed.), *Self-directed learning strategies in adult educational contexts*, pp. 1–22, IGI Global, Hershey, PA.

Shulman, L.S., 2004, *The wisdom of practice. Essays on teaching, learning and learning to teach*, Jossey-Bass, San Francisco, CA.

Siviy, S.M., 2016, 'A brain motivated to play-insights into the neurobiology of playfulness', *Behaviour* 153(6–7), 819–844. https://doi.org/10.1163/1568539X-00003349

Skaalvik, E.M. & Skaalvik, S., 2018, 'Job demands and job resources as predictors of teacher motivation and well-being', *Social Psychology of Education* 21, 1251–1275. https://doi.org/10.1007/s11218-018-9464-9468

Smagorinsky, P. & Barnes, M.E., 2014, 'Revisiting and revising the apprenticeship of observation', *Teacher Education Quarterly* 41(4), 29–52.

Smith, K., 2014, *Once a teacher, always a teacher? Examining teacher attrition in a Norwegian and international Perspective*, Application submitted to the Norwegian research council, FINNUT program, University of Bergen, Bergen.

Soulé, H., & Warrick, T., 2015, 'Defining 21st century readiness for all students: What we know and how to get there', *Psychology of Aesthetics, Creativity, and the Arts* 9(2), 178–186. https://doi.org/10.1037/aca0000017

Tashakkori, A. & Teddlie, C., 2008, *Mixed methodology: Combining qualitative and quantitative approaches*, Sage, Thousand Oaks, CA.

Tinto, V., 1988, 'Stages of student departure: Reflections on the longitudinal character of student leaving', *Journal of Higher Education* 59(4), 438–455.

Tinto, V., 1993, *Leaving college: Rethinking the causes and cures of student attrition*, 2nd edn., University of Chicago Press, Chicago, IL.

Troesch, L.M. & Bauert, C.E., 2020, 'Is teaching less challenging for career switchers? First and second career teachers' appraisal of professional challenges and their intention to leave teaching', *Frontiers in Psychology* 10, 3067. https://doi.org/10.3389/fpsyg.2019.03067

Universities South Africa, n.d., *Understanding students: A key to systemic success*, viewed 30 October 2021, http://www.usaf.ac.za.

Van Zyl, A., 2010, 'The predictive value of pre-entry attributes for student academic performance in the South African context', Unpublished PhD thesis, University of Johannesburg.

Voss, T. & Kunter, M., 2019, '"Reality shock" of beginning teachers? Changes in teacher candidates' emotional exhaustion and constructivist-oriented beliefs', *Journal of Teacher Education* 34, 154–170. https://doi.org/10.1177/0022487119839700

Vygotsky, L.S., 1978, *Mind in society*, Harvard University Press, Cambridge.

Chapter 6

Ananchenkova, P. & Bazhenova, S., 2017, 'Interactive forms of teaching "pilgrim tourism" creation and use in distance training of managers of tourism', in *12th International Conference on Virtual Learning, IVCL 2017 proceedings*, Bucharest, Romania, October 28, 2017, pp. 131–135.

Barra, E., Gordillo, A. & Quemada, J., 2014, 'Virtual science hub: An open-source platform to enrich science teaching', *International Journal of Educational and Pedagogical Sciences* 8(3), 741–746. https://doi.org/10.5281/zenodo.1091470

Behrendt, M. & Franklin, T., 2014, 'A review of research on school field trips and their value in education', *International Journal of Environmental and Science Education* 9(3), 235–245.

Bell, D. & Smith, J., 2020, 'Learning beyond museum walls: Virtual excursions at Te Papa Tongarewa', in C. Koh (ed.), *Diversifying learner experience: A kaleidoscope of instructional approaches and strategies*, pp. 121–135, Springer, Singapore.

Boell, S.K. & Cecez-Kecmanovic, D., 2015, 'On being "systematic" in literature reviews', in L.P. Willcocks, C. Sauer & M.C. Lacity (eds.), *Formulating research methods for information systems*, Palgrave Macmillan, London.

Bolhuis, S. & Voeten, M.J., 2001, 'Toward self-directed learning in secondary schools: What do teachers do?', *Teaching and Teacher Education* 17(7), 837–855. https://doi.org/10.1016/S0742-051X(01)00034-8

Bosch, C., Laubscher, D. & Olivier, J., 2020, 'The affordances of the community of inquiry framework for self-directed blended learning in South African research', in J. Olivier (ed.), *Self-directed multimodal learning in higher education* (NWU Self-Directed Learning Series Volume 5), pp. 51–92, AOSIS, Cape Town. https://doi.org/10.4102/aosis.2020.BK210.02

Bosch, C., Mentz, E. & Goede, R., 2019, 'Self-directed learning: A conceptual overview', in E. Mentz, J. De Beer & R. Bailey (eds.), *Self-directed learning for the 21st century: Implications for higher*

education (NWU Self-Directed Learning Series Volume 1), pp. 1–36, AOSIS, Cape Town. https://doi.org/10.4102/aosis.2019.BK134.01

Boyer, S.L., Edmondson, D.R., Artis, A.B. & Fleming, D., 2014, 'Self-directed learning: A tool for lifelong learning', *Journal of Marketing Education* 36(1), 20–32. https://doi.org/10.1177/0273475313494010

Brockett, R.G. & Hiemstra, R., 2018, *Self-direction in adult learning: Perspectives on theory, research, and practice*, Routledge, London.

Čablová, L., Pates, R., Miovský, M. & Noel, J., 2017, 'How to write a systematic review article and meta-analysis', in T.F. Babor, K. Stenius, R. Pates, M. Miovský, J. O'Reilly & P. Candon (eds.), *Publishing addiction science: A guide for the perplexed*, pp. 173–189, Ubiquity Press, London.

Cohen, L., Manion, L. & Morrison, K., 2011, *Research methods in education*, Routledge, London.

Condon, B.B., 2013, 'The present state of presence in technology', *Nursing Science Quarterly* 26(1), 24–28. https://doi.org/10.1177/0894318412466738

Crawford, R., 2017, 'Rethinking teaching and learning pedagogy for education in the twenty-first century: Blended learning in music education', *Music Education Research* 19(2), 195–213. https://doi.org/10.1080/14613808.2016.1202223

De Beer, J. (ed.), 2019, 'The decolonisation of the curriculum project: The affordances of indigenous knowledge for self-directed learning', in NWU Self-Directed Learning Series Volume 2, pp. i–406, AOSIS, Cape Town. https://doi.org/10.4102/aosis.2019.BK133

De Beer, J., Petersen, N. & Van Vuuren, H.J. (eds.), 2020, 'Becoming a teacher: Research on the work-integrated learning of student teachers', in NWU Self-Directed Learning Series Volume 4, pp. i–431, AOSIS, Cape Town. https://doi.org/10.4102/aosis.2020.BK215

Denysenko, V., Borysenko, N., Hrytsenko, I. & Sydorenko, N., 2020, 'Preparing the future educator to the creation of augmented reality excursions in local educational environments', *Information Technologies in Education* 4(45), 1–11. https://doi.org/10.14308/ite000736

Digolo, B.A., Andang'o, E.A. & Katuli, J., 2011, 'E-Learning as a strategy for enhancing access to music education', *International Journal of Business and Social Science* 2(11), 135–139.

Du Toit-Brits, C., 2021, 'The influence of the learning environment on promoting self-directed learning', in E. Mentz, D. Laubscher & J. Olivier (eds.), *Self-directed learning: An imperative for education in a complex society* (NWU Self-Directed Learning Series Volume 6), pp. 25–44, AOSIS, Cape Town. https://doi.org/10.4102/aosis.2021.BK279.02

Fischer, G., 2013, 'Supporting self-directed learning with cultures of participation in collaborative learning environments', in E. Christiansen, L. Kuure, A. Mørch & B. Lindström (eds.), *Problem-based learning for the 21st century: New practices and learning environments*, pp. 15–50, Aalborg University Press, Aalborg.

Fung, F.M., Choo, W.Y., Ardisara, A., Zimmermann, C.D., Watts, S., Koscielniak, T. et al., 2019, 'Applying a virtual reality platform in environmental chemistry education to conduct a field trip to an overseas site', *Journal of Chemical Education* 96(2), 382–386. https://doi.org/10.1021/acs.jchemed.8b00728

Gallego, D., Barra, E., Aguirre, S. & Huecas, G., 2012, 'A model for generating proactive context-aware recommendations in e-learning systems', in *2012 Frontiers in Education Conference Proceedings*, IEEE, Seattle, United States of America, October 03–06, 2012, pp. 1–6.

Garrison, D.R., 1992, 'Critical thinking and self-directed learning in adult education: An analysis of responsibility and control issues', *Adult Education Quarterly* 42(3), 136–148. https://doi.org/10.1177/074171369204200302

Garrison, D.R., 1997, 'Self-directed learning: Toward a comprehensive model', *Adult education quarterly* 48(1), 18–33.

Gordillo, A., Barra, E., Gallego, D. & Quemada, J., 2013a, 'An online e-learning authoring tool to create interactive multi-device learning objects using e-Infrastructure resources', in *2013 Frontiers in Education Conference Proceedings*, IEEE, Oklahoma City, United States of America, October 23–26, 2013, pp. 1914–1920.

Gordillo, A., Barra, E., Gallego, D. & Quemada, J., 2013b, 'A model for integrating learning object repository resources into web videoconference services', in *2013 Frontiers in Education Conference Proceedings*, IEEE, Oklahoma City, United States of America, October 23–26, pp. 383–392.

Gordillo, A., Barra, E., Gallego, D. & Quemada, J., 2013c, 'An architecture for integrating learning object repository resources into web videoconference services', in *2013 Frontiers in Education Conference Proceedings*, IEEE, Oklahoma City, United States of America, October 23–26, 2013, pp. 383–392.

Goupil, L. & Kouider, S., 2019, 'Developing a reflective mind: From core metacognition to explicit self-reflection', *Current Directions in Psychological Science* 28(4), 403–408. https://doi.org/10.1177/0963721419848672

Guglielmino, L.M., 1978, 'Development of the self-directed learning readiness scale', PhD thesis, University of Georgia.

Havenga, M., 2016, 'Students' accountability and responsibility in problem-based learning: Enhancing self-directed learning', in E. Mentz & I. Oosthuizen (eds.), *Self-directed learning research*, pp. 72–98, AOSIS, Cape Town.

Havenga, M., Breed, B., Mentz, E., Govender, D., Govender, I., Dignum, F. et al., 2013, 'Metacognitive and problem-solving skills to promote self-directed learning in computer programming: Teachers' experiences', *SA-eDUC* 10(2), 1–14.

Hiemstra, R. & Brockett, R.G., 2012, 'Reframing the meaning of self-directed learning: An updated model', in *Adult education research conference*, viewed 27 October 2021, https://newprairiepress.org/aerc/2012/papers/22

Kabdygalymova, D.S. & Isabayeva P.N., 2017, 'Formation of students' knowledge about tourist recreational facilities by virtual excursions', *Science Review* 7(6), 1–4.

Kazmina, L., Makarenko, V., Provotorina, V. & Shevchenko, E., 2020, 'Innovative technologies in vocational tourist-excursion education', in *E3S Web of Conferences* 210(12002), 1–8. https://doi.org/10.1177/0963721419848672

Kieslinger, B., Holocher, T., Barra Arias, E., Fabian, C.M., Gallego Vico, D., Aguirre Herrera, S. et al., 2013, 'Virtual excursions: A new way to explore science in class', in *International Conference on New Perspectives in Science Education*, Florence, Italy, March 14–15, pp. 1–5.

Knowles, M.S., 1975, *Self-directed learning: A guide for learners and teachers*, Follett, Chicago, IL.

Lee, K., Tsai, P.S., Chai, C.S. & Koh, J.H.L., 2014, 'Students' perceptions of self-directed learning and collaborative learning with and without technology', *Journal of Computer Assisted Learning* 30(5), 425–437. https://doi.org/10.1111/jcal.12055

Majherová, J., Palásthy, H. & Gazdíková, V., 2014, 'Virtual excursion in secondary education', in *12th IEEE International Conference on Emerging eLearning Technologies and Applications (ICETA)*, IEEE, Starý Smokovec, Slovakia, December 04–05, pp. 305–309.

Mentz, E. & Bailey, R. (eds.), 2020, 'Self-directed learning research and its impact on educational practice', in NWU Self-Directed Learning Series Volume 3, pp. i–420, AOSIS, Cape Town. https://doi.org/10.4102/aosis.2020.BK206

Mentz, E., De Beer, J. & Bailey, R. (eds.), 2019, 'Self-Directed Learning for the 21st Century: Implications for Higher Education', in NWU Self-Directed Learning Series Volume 1, pp. i–436, AOSIS, Cape Town. https://doi.org/10.4102/aosis.2019.BK134

Mentz, E., Laubscher, D., Olivier, J. (eds.), 2021, 'Self-Directed Learning: An imperative for education in a complex society', in NWU Self-Directed Learning Series Volume 6, pp. i–312, AOSIS, Cape Town. https://doi.org/10.4102/aosis.2021.BK279

Mentz, E. & Lubbe, A. (eds.), 2021, 'Learning through assessment: An approach towards Self-Directed Learning', in NWU Self-Directed Learning Series Volume 7, pp. i–286, AOSIS, Cape Town. https://doi.org/10.4102/aosis.2021.BK280

Mentz, E. & Oosthuizen, I. (eds.), 2016, *Self-directed learning research: An imperative for transforming the educational landscape*, AOSIS, Cape Town.

Merriam, S.B. & Bierema, L.L., 2014, *Adult learning: Linking theory and practice*, Jossey-Bass, San Francisco, CA.

Molchanova, I., Savchina, O., Goreeva, N. & Demidova, L., 2021, 'Comparative evaluation of conducting full-time and virtual excursions in teaching Russian as a foreign language', *Applied Linguistics Research Journal* 5(6), 35–42. https://doi.org/10.14744/alrj.2021.78045

Okoli, C., 2015, 'A guide to conducting a standalone systematic literature review', *Communications of the Association for Information Systems* 37(1), 43, 879–910. https://doi.org/10.17705/1CAIS.03743

Olivier, J. (ed.), 2020a, 'Self-directed multimodal learning in higher education', in NWU Self-Directed Learning Series Volume 5, pp. i–432, AOSIS, Cape Town. https://doi.org/10.4102/aosis.2020.BK210

Olivier, J., 2020b, 'Self-directed multimodal learning within a context of transformative open education', in J. Olivier (ed.), *Self-directed multimodal learning in higher education* (NWU Self-Directed Learning Series Volume 5), pp. 1–49, AOSIS, Cape Town. https://doi.org/10.4102/aosis.2020.BK210.01

Olivier, J., 2021, 'Sustainable quality education through self-directed multimodal learning, for open indigenous knowledge co-creation', in W. Leal Filho, R. Pretorius & L.O. De Sousa (eds.), *Sustainable development in Africa*, World Sustainability Series, pp. 91–107, Springer, Cham.

Olivier, J. & Wentworth, A., 2021, 'Self-directed learning at school and in higher education in Africa', in D. Burgos & J. Olivier (eds.), *Radical solutions for education in Africa*, pp. 17–39, Springer, Singapore.

Osman, A. & Wahab, N.A., 2011, 'Virtual excursions for tiny fingers: A shared experience', in *2011 International Conference on Information Science and Applications*, IEEE, Jeju Island, Republic of Korea, April 26–29, 2011, pp. 1–5.

Ozuah, P.O., Curtis, J. & Stein, R.E., 2001, 'Impact of problem-based learning on residents' self-directed learning', *Archives of Pediatrics & Adolescent Medicine* 155(6), 669–672. https://doi.org/10.1001/archpedi.155.6.669

Pilling-Cormick, J. & Garrison, D.R., 2007, 'Self-directed and self-regulated learning: Conceptual links', *Canadian Journal of University Continuing Education* 33(2), 13–33. https://doi.org/10.21225/D5S01M

Pribilová, K., Gazdíková, V. & Horváth, R., 2014, 'Use of virtual excursions at secondary schools in Slovakia', in *12th IEEE International Conference on Emerging eLearning Technologies and Applications (ICETA)*, IEEE, Starý Smokovec, Slovakia, December 04–05, pp. 163–167.

Rebar, B.M., 2012, 'Teachers' sources of knowledge for field trip practices', *Learning Environments Research* 15(1), 81–102.

Reeve, J., 2012, 'A self-determination theory perspective on student engagement', in S. Christenson, A. Reschly & C. Wylie (eds.), *Handbook of research on student engagement*, pp. 149–172, Springer, Boston, MA.

Robinson, J.D. & Persky, A.M., 2020, 'Developing self-directed learners', *American Journal of Pharmaceutical Education* 84(3), 847512. https://doi.org/10.5688/ajpe847512

Seeletso, M. & Olivier, J., 2020, 'Diffractive pathways in self-directed multimodal learning: Experiences from Botswana and South Africa', in J. Olivier (ed.), *Self-directed multimodal learning in higher education* (NWU Self-Directed Learning Series Volume 5), pp. 165–199, AOSIS, Cape Town. https://doi.org/10.4102/aosis.2020.BK210.05

Strelkova, O.A. & Ryauzova, O.Y., 2020, 'Virtual excursion into Russian culture with elementary level foreign students', *Русистика без границ: Международно научно списание* 4(2), 70–79.

Sze-Yeng, F. & Hussain, R.M.R., 2010, 'Self-directed learning in a socio-constructivist learning environment', *Procedia-Social and Behavioural Sciences* 9, 1913–1917. https://doi.org/10.1016/j.sbspro.2010.12.423

Tarasenko, R.O., Amelina, S.M., Kazhan, Y.M. & Bondarenko, O.V., 2020, 'The use of AR elements in the study of foreign languages at the university', in O.Y. Burov & A.E. Kiv (eds.), *Proceedings of*

the 3rd International Workshop on Augmented Reality in Education (AREdu 2020), Kryvyi Rih, Ukraine, 13 May, pp. 129–142.

Thönnessen, N. & Budke, A., 2021, 'The use of digital field trip guides for "learning on-site" and "virtual excursions" in a COVID-19 world', in R.E. Ferdig & K.E. Pytash (eds.), *What teacher educators should have learned from 2020*, pp. 255–266, Association for the Advancement of Computing in Education (AACE), s.l.

Tserklevych, V. & Koval, L., 2020, 'Virtual excursions on the platforms of virtual museums: Collaboration of educational tourism and innovative educational practices', in M. Barna (ed.), *Trends, prospects and challenges of sustainable tourism development*, pp. 67–78, Lviv University of Trade and Economics, Lviv.

Tserklevych, V., Prokopenko, O., Goncharova, O., Horbenko, I., Fedorenko, O. & Romanyuk, Y., 2021, 'Virtual museum space as the innovative tool for the student research practice', *International Journal of Emerging Technologies in Learning* 16(14), 213–231. https://doi.org/10.3991/ijet.v16i14.22975

Uz, R. & Uzun, A., 2018, 'The influence of blended learning environment on self-regulated and self-directed learning skills of learners', *European Journal of Educational Research* 7(4), 877–886. https://doi.org/10.3991/ijet.v16i14.22975

Van Deur, P., 2017, *Managing self-directed learning in primary school education: Emerging research and opportunities: Emerging research and opportunities*, IGI Global, Hershey, PA.

Van Merriënboer, J.J. & Sluijsmans, D.M., 2009, 'Toward a synthesis of cognitive load theory, four-component instructional design, and self-directed learning', *Educational Psychology Review* 21(1), 55–66. https://doi.org/10.1007/s10648-008-9092-5

Williamson, S.N., 2007, 'Development of a self-rating scale of self-directed learning', *Nurse Researcher* 14(2), 66–83. https://doi.org/10.7748/nr2007.01.14.2.66.c6022

Xiao, Y. & Watson, M., 2019, 'Guidance on conducting a systematic literature review', *Journal of Planning Education and Research* 39(1), 93–112. https://doi.org/10.1177/0739456X17723971

Zhu, M., Bonk, C.J. & Doo, M.Y., 2020, 'Self-directed learning in MOOCs: Exploring the relationships among motivation, self-monitoring and self-management', *Education Technology Research and Development* 68, 2073–2093. https://doi.org/10.1007/s11423-020-09747-8

Zinonos, N.O, Vihrova, E.V. & Pikilnyak, A.V., 2019, 'Prospects of using the augmented reality for training foreign students at the preparatory departments of universities in Ukraine', *Педагогіка вищої та середньої школи*, Випуск 51(2018), 115–122. https://doi.org/10.31812/pedag.v51i0.3661

Chapter 7

Abdullah, J., Mohd-Isa, W.N. & Samsudin, M.A., 2019, 'Virtual reality to improve group work skill and self-directed learning in problem-based learning narratives', *Virtual Reality* 23(4), 461–471. https://doi.org/10.1007/s10055-019-00381-1

Alt, D. & Raichel, N., 2020, 'Problem-based learning, self-and peer assessment in higher education: Towards advancing lifelong learning skills', *Research Papers in Education* n.v., 1–25. https://doi.org/10.1080/02671522.2020.1849371

Ansarian, L. & Mohammadi, F.S., 2018, 'Problem-based learning in action: Review of empirical studies', *Pertanika Journal of Social Sciences & Humanities* 26(T), 13–32.

Bagheri, M., Ali, W.Z.W., Abdullah, M.C.B. & Daud, S.M., 2013, 'Effects of project-based learning strategy on self-directed learning skills of educational technology students', *Contemporary Educational Technology* 4(1), 15–29. https://doi.org/10.30935/cedtech/6089

Bate, E., Hommes, J., Duvivier, R. & Taylor, D.C.M., 2014, 'Problem-based learning (PBL): Getting the most out of your students – Their roles and responsibilities: AMEE Guide No. 84', *Medical Teacher* 36(1), 1–12. https://doi.org/10.3109/0142159X.2014.848269

Bessa, B.R., Santos, S. & Duarte, B.J., 2019, 'Toward effectiveness and authenticity in PBL: A proposal based on a virtual learning environment in computing education', *Computer Applications in Engineering Education* 27(2), 452–471. https://doi.org/10.1002/cae.22088

Botha, C. & Reyneke, E.M., 2020, '"WIL goes POP": The role of a professional orientation programme in addressing the apprenticeship of observation in first-year Bachelor of Education students', in J. De Beer, P. Petersen & H.J. van Vuuren (eds.), *Becoming a teacher: Research on the work-integrated learning of student teachers* (NWU Self-Directed Learning Series Volume 4), pp. 215–245, AOSIS, Cape Town. https://doi.org/10.4102/aosis.2020.BK215.08

Bridges, S.M., Hmelo-Silver, C.E., Chan, L.K., Green, J.L. & Saleh, A., 2020, 'Dialogic intervisualizing in multimodal inquiry', *International Journal of Computer-Supported Collaborative Learning* 15(3), 283–318. https://doi.org/10.1007/s11412-020-09328-0

Casap, J., 2018. *Twitter Tweet from @jcasap*, viewed 28 January 2018, twitter.com/jcasap/status/957639397364719616?lang=en

Coleman, T.E. & Money, A.G., 2020, 'Student-centred digital game–based learning: A conceptual framework and survey of the state of the art', *Higher Education* 79(3), 415–457. https://doi.org/10.1007/s10734-019-00417-0

Cowin, J.B., 2020, 'Digital worlds and transformative learning: Google expeditions, Google arts and culture, and the merge cube', *International Research and Review* 10(1), 42–53.

De Beer, J., Van der Walt, M. & Bunt, B., 2020, 'The affordances of case-based teaching that draws on drama in pre-service teacher education', in J. de Beer, N. Petersen & H.J. van Vuuren (eds.), *Becoming a teacher: Research on the work-integrated learning of student teachers* (NWU Self-Directed Learning Series Volume 4), pp. 189–214, AOSIS, Cape Town. https://doi.org/10.4102/aosis.2020.BK215.07

De Graaff, E. & Kolmos, A., 2003, 'Characteristics of problem-based learning', *International Journal of Engineering Education* 19(5), 657–662.

Ertmer, P.A. & Glazewski, K.D., 2015, 'Essentials for PBL implementation: Fostering collaboration, transforming roles, and scaffolding learning', in A. Walker, H. Leary, C.E. Hmelo-Silver & P.A. Ertmer (eds.), *Essential readings in problem-based learning*, pp. 89–106, Purdue University Press, Lafayette, IN.

Fitzgerald, T. & Gunter, H.M., 2011, 'Dancing to a new tune? Centralisation and decentralisation in educational administration', *Journal of Educational Administration and History* 43(2), 89–93. https://doi.org/10.1080/00220620.2011.560258

Garrison, D.R., Anderson, T. & Archer, W., 2000, 'Critical inquiry in a text-based environment: Computer conferencing in higher education', *The Internet and Higher Education* 2(2–3), 87–105. https://doi.org/10.1016/S1096-7516(00)00016-6

Golightly, A., 2018, 'The influence of an integrated PBL format on geography students' perceptions of their self-directedness in learning', *Journal of Geography in Higher Education* 42(3), 460–478. https://doi.org/10.1080/03098265.2018.1463974

Gomoll, A., Hillenburg, B. & Hmelo-Silver, C.E., 2020, '"I have never had a PBL like this before": On viewing, re-viewing, and co-design', *Interdisciplinary Journal of Problem-based Learning* 14(1), n.p. https://doi.org/10.14434/ijpbl.v14i1.28802

Guglielmino, L.M., 1977, 'Development of the self-directed learning readiness scale', unpublished PhD dissertation, The University of Georgia.

Guglielmino, L.M., 2013, 'The case for promoting self-directed learning in formal educational institutions', *SA-eDUC Journal* 10(2), 1–18.

Häkkinen, P., Järvelä, S., Mäkitalo-Siegl, K., Ahonen, A., Näykki, P. & Valtonen, T., 2017, 'Preparing teacher-students for twenty-first-century learning practices (PREP 21): A framework for enhancing collaborative problem-solving and strategic learning skills', *Teachers and Teaching* 23(1), 25–41. https://doi.org/10.1080/13540602.2016.1203772

Harron, J.R. & Mason, L., 2021, 'Creating virtual spaces: Using extended reality and transformative technologies to prepare teachers to thrive in an ever-changing world', in R.E. Ferdig & K.E. Pytash (eds.), *What teacher educators should have learned from 2020*, Association for the Advancement of Computing in Education (AACE), s.l.

Havenga, H.M., 2015, 'Project-based learning in higher education: Exploring programming students' development towards self-directedness', *South African Journal of Higher Education* 29(4), 135–157. https://doi.org/10.20853/29-4-515

Hmelo-Silver, C.E., 2004, 'Problem-based learning: What and how do students learn?', *Educational Psychology Review* 16(3), 235–266. https://doi.org/10.1023/B:EDPR.0000034022.16470.f3

Jagals, D., 2020, 'The value of work-integrated learning for professional teacher development programmes in open distance learning', in J. de Beer, N. Petersen & H.J. van Vuuren (eds.), *Becoming a teacher: Research on the work-integrated learning of student teachers* (NWU Self-Directed Learning Series Volume 4), pp. 65–88, AOSIS, Cape Town. https://doi.org/10.4102/aosis.2020.BK215.03

Jaloliddin, J.S., 2020, 'Technology-assisted foreign laguage learning (TALL) in the digital age', *European Journal of Research and Reflection in Educational Sciences* 8(10), 15–17.

Johnson, D.W. & Johnson, F.P., 2014, *Joining together: Group theory and group skills*, Pearson Education, Harlow.

Johnson, D.W. & Johnson, R.T., 2018, 'Cooperative learning: The foundation for active learning', in S.M. Brito (ed.), *Active learning-beyond the future*, IntechOpen, s.l.

Knowles, M.S., 1975, *Self-directed learning: A guide for learners and teachers*, Cambridge, New York, NY.

Lea, S.J., Stephenson, D. & Troy, J., 2003, 'Higher education students' attitudes to student-centred learning: Beyond "educational bulimia?"', *Studies in Higher Education* 28(3), 321–334. https://doi.org/10.1080/03075070309293

Lurina, M. & Gorlova, E., 'Adopting 21st century competencies for a technical university curriculum', in *Society Integration Education Proceedings of the International Scientific Conference*, Rēzekne, Latvia, May 25–26, 2018, pp. 159–167.

Miller, K.E., Riley, J. & Slay, L., 2021, 'School belonging matters now more than ever: Preparing teachers to foster a technology-mediated culture of care', in R.E. Ferdig & K.E. Pytash (eds.), *What teacher educators should have learned from 2020*, Association for the Advancement of Computing in Education, s.l.

Mohd-Yusof, K., 2017, 'Sustaining change for PBL at the course level: Taking the scholarly approach', in A. Guerra, R. Ulseth & A. Kolmos (eds.), *PBL in engineering education*, Sense Publishers, Rotterdam.

Mozas-Calvache, A.T. & Barba-Colmenero, F., 2013, 'System for evaluating groups when applying project-based learning to surveying engineering education', *Journal of Professional Issues in Engineering Education and Practice* 139(4), 317–324. https://doi.org/10.1061/(ASCE)EI.1943-5541.0000160

Par, S.H. & Thant, K.N., 2020, 'Critical thinking disposition and self-directed learning readiness of university students', *Journal of the Myanmar Academy of Arts and Science* XVIII(9B), 327–335.

Petersen, N., De Beer, J. & Mentz, E., 2020, 'The first-year student teacher as a self-directed learner', in J. de Beer, N. Petersen & H.J. van Vuuren (eds.), *Becoming a teacher: Research on the work-integrated learning of student teachers* (NWU Self-Directed Learning Series Volume 4), pp. 115–155, AOSIS, Cape Town. https://doi.org/10.4102/aosis.2020.BK215.05

Petersen, N., Golightly, A. & Dudu, W.T., 2019, 'Engaging pedagogies to facilitate the border-crossing between the Natural Sciences and indigenous knowledge: Implications for science teacher education', in J. De Beer (ed.), *The decolonisation of the curriculum project: The affordances of indigenous knowledge for self-directed learning* (NWU Self-Directed Learning Series Volume 2), pp. 143–180, AOSIS, Cape Town. https://doi.org/10.4102/aosis.2019.BK133.06

Peterson, A.T., Beymer, P.N. & Putnam, R.T., 2018, 'Synchronous and asynchronous discussions: Effects on cooperation, belonging, and affect', *Online Learning* 22(4), 7–25. https://doi.org/10.24059/olj.v22i4.1517

Saputra, M.D., Joyoatmojo, S., Wardani, D.K. & Sangka, K.B., 2019, 'Developing critical-thinking skills through the collaboration of Jigsaw model with problem-based learning model', *International Journal of Instruction* 12(1), 1077–1094. https://doi.org/10.29333/iji.2019.12169a

Savery, J.R., 2015, 'Overview of problem-based learning: Definitions and distinctions', in A. Walker, H. Leary, C.E. Hmelo-Silver & P.A. Ertmer (eds.), *Essential readings in problem-based learning: Exploring and extending the legacy of Howard S. Barrows*, pp. 5–15, Purdue University Press, West Lafayette, IN.

Savin-Baden, M., 2007, *A practical guide to problem-based learning online*, Routledge, New York, NY.

Schoeniger, G., 2021, *The entrepreneurial mindset imperative*, The Entrepreneurial Learning Initiative, viewed 29 October 2021, https://elimindset.com/newly-published-white-paper-the-entrepreneurial-mindset-imperative/

Sebotsa, T., Petersen, N. & Speight Vaughn, M., 2020, 'The role of work-integrated learning excursions in preparing student teachers for diverse classrooms and teaching social justice in South African classrooms', in J. de Beer, N. Petersen & H.J. van Vuuren (eds.), *Becoming a teacher: Research on the work-integrated learning of student teachers* (NWU Self-Directed Learning Series Volume 4), pp. 279–322, AOSIS, Cape Town. https://doi.org/10.4102/aosis.2020.BK215.10

Seibert, S.A., 2021, 'Problem-based learning: A strategy to foster generation Z's critical thinking and perseverance', *Teaching and Learning in Nursing* 16(1), 85–88. https://doi.org/10.1016/j.teln.2020.09.002

Servant, V.F., 2016, 'Revolutions & re-iterations: An intellectual history of problem-based learning', PhD, Erasmus University Rotterdam.

Shroff, R.H., Ting, F.S., Lam, W.H., Cecot, T., Yang, J. & Chan, L.K., 2021, 'Conceptualization, development and validation of an instrument to measure learners' perceptions of their active learning strategies within an active learning context', *International Journal of Educational Methodology* 7(1), 201–223. https://doi.org/10.12973/ijem.7.1.201

Sumuer, E., 2018, 'Factors related to college students' self-directed learning with technology', *Australasian Journal of Educational Technology* 34(4), 29–43. https://doi.org/10.14742/ajet.3142

Thorndahl, K.L. & Stentoft, D., 2020, 'Thinking critically about critical thinking and problem-based learning in higher education: A scoping review', *Interdisciplinary Journal of Problem-Based Learning* 14(1), n.p. https://doi.org/10.14434/ijpbl.v14i1.28773

Van Vuuren, H.J., 2020, 'The journey of becoming a professional teacher: Policy directives and current practices', in J. de Beer, N. Petersen & H.J. van Vuuren (eds.), *Becoming a teacher: Research on the work-integrated learning of student teachers* (NWU Self-Directed Learning Series Volume 4), pp. 1–41, AOSIS, Cape Town. https://doi.org/10.4102/aosis.2020.BK215.01

Wiek, A., Xiong, A., Brundiers, K. & Van Der Leeuw, S., 2014, 'Integrating problem-and project-based learning into sustainability programs: A case study on the school of sustainability at Arizona State University', *International Journal of Sustainability in Higher Education* 15(4), 431–449. https://doi.org/10.1108/IJSHE-02-2013-0013

Zhu, G., Raman, P., Xing, W. & Slotta, J., 2021, 'Curriculum design for social, cognitive and emotional engagement in knowledge building', *International Journal of Educational Technology in Higher Education* 18(1), 1–19. https://doi.org/10.1186/s41239-021-00276-9

Zhu, M., 2021, 'Enhancing MOOC learners' skills for self-directed learning', *Distance Education* 42(3), 441–460. https://doi.org/10.1080/01587919.2021.1956302

Chapter 8

Adedoyin, O.B. & Soykan, E., 2020, 'COVID-19 pandemic and online learning: The challenges and opportunities', *Interactive Learning Environments* 1–13. https://doi.org/10.1080/10494820.2020.1813180

Biggs, J. & Tang, C., 2011, *Teaching for quality learning at university*, 4th edn., McGraw Hill, Open University Press, Berkshire.

Bosch, C., 2017, 'Promoting self-directed learning through the implementation of cooperative learning in a higher education blended learning environment', Doctoral dissertation, North-West University.

Breed, B., 2016, 'Exploring a co-operative learning approach to improve self-directed learning in higher education', *Journal for New Generation Sciences* 14(3), 1–21.

Carolini, P., 2017, 'Curricula for sustainability in higher education [Book Review]', *Journal of Ethnic and Cultural Studies* 4(2), 102–104. https://doi.org/10.29333/ejecs/86

Cavanagh, M., 2011, 'Students' experiences of active engagement through cooperative learning activities in lectures', *Active Learning in Higher Education* 12(1), 23–33. https://doi.org/10.1177/1469787410387724

Cheng, S.F., Kuo, C.L., Lin, K.C. & Lee-Hsieh, J., 2010, 'Development and preliminary testing of a self-rating instrument to measure self-directed learning ability of nursing students', *International Journal of Nursing Studies* 47(9), 1152–1158. https://doi.org/10.1016/j.ijnurstu.2010.02.002

Colak, E., 2015, 'The effect of cooperative learning on the learning approaches of students with different learning styles', *Eurasian Journal of Educational Research* 5(59), 17–34. https://doi.org/10.14689/ejer.2015.59.2

De Beer, J. & Henning, E., 2011, 'Retreating to a Vygotskian stage where pre-service teachers play out social, "dramatical collisions"', *Acta Academica* 43(4), 203–228.

Mentz, E. & De Beer, J., 2019, 'The use of Cultural-Historical Activity Theory in researching the affordances of indigenous knowledge for self-directed learning', in J. de Beer (ed.), *The decolonisation of the curriculum project: The affordances of indigenous knowledge for self-directed learning* (NWU Self-Directed Learning Series Volume 2), pp. 49–86, AOSIS, Cape Town. https://doi.org/10.4102/aosis.2019.BK133.03

De Beer, J., Petersen, N. & Dubar-Krige, H., 2011, 'An exploration of the value of an educational excursion for pre-service teachers', *Journal of Curriculum Studies* 44(1), 89–110. https://doi.org/10.1080/00220272.2011.576771

Denzin, N.K., 2009, *The research act: A theoretical introduction to sociological methods*, 3rd edn., Prentice Hall, Englewood Cliffs, NJ.

Deutsch, M., 1949, 'A theory of cooperation and competition', *Human Relations* 2(2), 129–152. https://doi.org/10.1177/001872674900200204

Du, C., 2015, 'The effect of cooperative learning on students' attitude in first-year principles of accounting course', *Business Education Innovation Journal* 7(2), 107–116.

Engeström, Y., 1987, *Learning by expanding: An activity-theoretical approach to developmental research*, Orienta-Konsultitl, Helsinky.

Felder, R.M. & Brent, R., 2007, 'Cooperative learning', in P.A. Mabrouk (ed.), *Active learning: Models from the analytical sciences*, pp. 34–53, American Chemical Society, Washington, DC.

Gedera, D.S. & Williams, P.J., 2013, 'Using activity theory to understand contradictions in an online university course facilitated by Moodle', *International Journal of Information Technology and Computer Science* 32–41.

Gillies, R.M., 2003, 'Structuring cooperative group work in classrooms', *International Journal of Educational Research* 39(1–2), 35–49. https://doi.org/10.1016/S0883-0355(03)00072-7

Gillies, R.M., 2016, 'Cooperative learning: Review of research and practice', *Australian Journal of Teacher Education* 41(3), 39–54. https://doi.org/10.14221/ajte.2016v41n3.3

Gillies, R.M. & Boyle, M., 2010, 'Teachers' reflections on cooperative learning: Issues of implementation', *Teaching and Teacher Education* 26(4), 933–940. https://doi.org/10.1016/j.tate.2009.10.034

Hasan, H. & Kazlauskas, A., 2014, *Activity theory: Who is doing what, why and how*, viewed n.d., https://ro.uow.edu.au/buspapers/403.

Hashim, N.H. & Jones, M.L., 2007, *Activity theory: A framework for qualitative analysis*, viewed n.d., http://ro.uow.edu.au/commpapers/408.

Henning, E., Van Rensburg, W. & Smit, B., 2004, *Finding your way in qualitative research*, Van Schaik Publishers, Pretoria.

Hammond, M. & Collins, R., 2013, *Self-directed learning: Critical practice*, Routledge, New York, NY.

James, G., 2018, 'A narrative inquiry perspective into coping mechanisms of international postgraduate students' transition experiences', *American Journal of Qualitative Research* 2(1), 41–56. https://doi.org/10.29333/ajqr/5793

Johnson, D.W. & Johnson, R.T., 2013, *Joining together: Group theory and group skills*, 11th edn., Pearson Education, Upper Saddle River, NJ.

Johnson, D.W. & Johnson, R.T., 2014a, *Joining together: Group theory and group skills*, Pearson Education, London.

Johnson, D.W. & Johnson, R.T., 2014b, 'Cooperative learning in the 21st century', *Anales de Psicologia/Annals of Psychology* 30(3), 841–851. https://doi.org/10.6018/analesps.30.3.201241

Johnson, D.W. & Johnson, R.T., 2015, 'Theoretical approaches to cooperative learning', in R. Gillies (ed.), *Collaborative learning: Developments in research and practice*, pp. 17–46, Nova, New York, NY.

Johnson, D.W., Johnson, R.T. & Holubec, E.J., 2013, *Cooperation in the classroom*, 9th edn., Interaction Book Company, Edina, MN.

Johnson, D.W., Johnson, R.T., Roseth, C. & Shin, T.S., 2014, 'The relationship between motivation and achievement in interdependent situations', *Journal of Applied Social Psychology* 44(9), 622–633. https://doi.org/10.1111/jasp.12280

Johnson, D.W., Johnson, R.T. & Stanne, M.E., 2000, *Cooperative learning methods: A meta-analysis*, University of Minnesota Press, Minneapolis, MN.

Kivunja, C. & Kuyini, A.B., 2017, 'Understanding and applying research paradigms in educational contexts', *International Journal of Higher Education* 6(5), 26–41. https://doi.org/10.5430/ijhe.v6n5p26

Lim, D.H., 2004, 'Cross cultural differences in online learning motivation', *Educational Media International* 41(2), 163–175. https://doi.org/10.1080/09523980410001685784

Loh, R.C. & Ang, C., 2020, 'Unravelling cooperative learning in higher education: A review of research', *Research in Social Sciences and Technology* 5(2), 22–39. https://doi.org/10.46303/ressat.05.02.2

Loh, R.C. & Teo, T.C., 2017, 'Understanding Asian students' learning styles, cultural influence and learning strategies', *Journal of Education & Social Policy* 7(1), 449–521.

Lubbe, A., 2015, 'Cooperative base groups in higher education: The impact on Life Sciences students' self-directed learning readiness', Master's dissertation, North-West University.

Lubbe, A., 2020, 'Cooperative learning-embedded assessment: Implications for students' assessment literacy and self-directedness in learning', PhD thesis, North-West University.

Mentz, E. & De Beer, J., 2017, 'The affordances of cultural-historical activity theory as a research lens in studying education from a socio-economic perspective', Paper Presented at the 4th Teaching and Education Conference, Venice, Italy, n.d., 2017, n.p.

Mentz, E. & Van Zyl, S., 2018, 'The impact of cooperative learning on self-directed learning abilities in the computer applications technology class', *International Journal of Lifelong Education* 37(4), 482–494. https://doi.org/10.1080/02601370.2018.1513426

Merriam, S.B., 2009, *Qualitative research: A guide to design and implementation*, Jossey-Bass, San Francisco, CA.

Millis, B.J. (ed.), 2010, *New pedagogies and practices for teaching in higher education: Cooperative learning in higher education, across the disciplines, across the academy*, Stylus Publishing, Sterling, VA.

Nespor, J., 2000, 'Anonymity and place in qualitative inquiry', *Qualitative Inquiry* 6(4), 546–569. https://doi.org/10.1177/107780040000600408

Patton, M.Q., 2002, *Qualitative research and evaluation methods*, 3rd edn., Sage, Thousand Oaks, CA.

Rogoff, B., 1995, *Apprenticeship in thinking: Development in social context*, Harvard University Press, Cambridge, MA.

Saavedra, A.R. & Opfer, V.D., 2012, *Teaching and learning 21st century skills: Lessons from the learning sciences*, Asia Society, Partnership for Global Learning: RAND Corporation, s.l.

Saldaña, J., 2009, *The coding manual for qualitative researchers*, Sage, Los Angeles, CA.

Seng, E.L.K., 2014, 'Investigating teachers' views of student-centred learning approach', *International Education Studies* 7(7), 143–148. https://doi.org/10.5539/ies.v7n7p143

Shimazoe, J. & Aldrich, H., 2010, 'Group work can be gratifying: Understanding & overcoming resistance to cooperative learning', *College Teaching* 58(2), 52–57. https://doi.org/10.1080/87567550903418594

Slavin, R.E., 2012, 'Classroom applications of cooperative learning', in K. Harris, S. Graham, T. Urdan, A. Bus, S. Major & L. Swanson (eds.), *APA handbook of educational psychology, Vol. 3: Application to teaching and learning*, pp. 359–378, American Psychological Association, Washington, DC.

Slavin, R.E., 2014, 'Making cooperative learning powerful', *Educational Leadership* 72, 22–26.

Swan, K., Shen, J. & Hiltz, S.R., 2006, 'Assessment and collaboration in online learning', *Journal of Asynchronous Learning Networks* 10(1), 45–62. https://doi.org/10.24059/olj.v10i1.1770

Sutherland, S., Stuhr, P.T., Ressler, J., Smith, C. & Wiggin, A., 2019, 'A model for group processing in cooperative learning', *Journal of Physical Education, Recreation & Dance* 90(3), 22–26. https://doi.org/10.1080/07303084.2019.1559676

Thanh, P.T.H., Gillies, R. & Renshaw, P., 2008, 'Cooperative learning (CL) and academic achievement of Asian students: A true story', *International Education Studies* 1(3), 82–88. https://doi.org/10.5539/ies.v1n3p82

Tracy, S.J., 2020, *Qualitative research methods: Collecting evidence, crafting analysis, communicating impact*, John Wiley & Sons, Hoboken, NJ.

Tran, V., 2013, 'Effects of student teams achievement division (STAD) on academic achievement, and attitudes of Grade 9 secondary school students towards mathematics', *International Journal of Sciences* 2(4), 5–15.

Veldman, M.A., Van Kuijk, M.F., Doolaard, S. & Bosker, R.J., 2020, 'The proof of the pudding is in the eating? Implementation of cooperative learning: Differences in teachers' attitudes and beliefs', *Teachers and Teaching* 26(1) 103–117. https://doi.org/10.1080/13540602.2020.1740197

Veresov, N., 2007, 'Sign mediation: Magic triangle: Sign-mediated action and behind', in *ISCAR 2007, Fourth Nordic Conference on Cultural and Activity Research*, pp. 15–17, Oslo.

Wyk, M.M.V., 2012, 'The effects of the STAD-cooperative learning method on student achievement, attitude and motivation on economics education', *Journal of Social Science* 33(2), 261–270. https://doi.org/10.1080/09718923.2012.11893104

Yager, R.E., 2000, 'The constructivist learning model', *The Science Teacher* 67(1), 44–45.

Yakubu, N. & Dasuki, S., 2021, *Emergency online teaching and learning in a Nigerian private university: An activity theory perspective*, Working Paper, UK Academy for Information Systems, London.

Vygotsky, L.S., 1978, *Mind in society*, Harvard University Press, Cambridge, MA.

Chapter 9

Adler, J. & Reed, Y., 2002, *Challenges teacher development: An investigation of take-up in South Africa*, Van Schaik Publishers, Pretoria.

Artiles, A.J., 2011, 'Toward an interdisciplinary understanding of educational equity and difference: The case of the racialization of ability', *Educational Researcher* 40(9), 431–445. https://doi.org/10.3102/0013189X11429391

Avalos, B., 2011, 'Teacher professional development in teaching and teacher education over ten years', *Teaching and Teacher Education* 27(1), 10–20. https://doi.org/10.1016/j.tate.2010.08.007

Avis, J., 2009, 'Transformation or transformism: Engeström's version of activity theory?', *Educational Review* 61(2), 151–165. https://doi.org/10.1080/00131910902844754

Blohm, I. & Leimeister, J.M., 2013, 'Design of IT-based enhancing services for motivational support and behavioral change', *Business and Information System Engineering* 5, 275–278. https://doi.org/10.1007/s12599-013-0273-5

Bransford, J. & Darling-Hammond, L., 2005, *Preparing teachers for a changing world: What teachers should learn and be able to do*, Jossey-Bass, San Francisco, CA.

Cleveland-Innes, M. & Campbell, P., 2012, 'Emotional presence, learning and the online learning environment', *The International Review of Research in Open and Distance Learning*, viewed 23 November 2021, from https://files.eric.ed.gov/fulltext/EJ1001716.pdf

Cole, M., 1996, *Cultural psychology: A once and future discipline*, s.n., s.l.

Creswell, J.W., & Creswell, J.D., 2018, Research design: Qualitative, quantitative and mixed-methods approaches, 5th edn., Sage, Los Angeles, CA.

Cole, M. & Engeström, Y., 1993, 'A cultural historical approach to distributed cognition', in G. Salomon (ed.), *Distributed cognitions: Psychological and educational considerations*, pp. 1–46, Cambridge University Press, Cambridge.

De Beer, J. & Henning, E., 2011, 'Retreating to a Vygotskyan stage where pre-service teachers play out social "dramatical collisions"', *Acta Academia* 43(4), 1–26.

Mentz, E. & De Beer, J., 2019, 'The use of Cultural-Historical Activity Theory in researching the affordances of indigenous knowledge for self-directed learning', in J. de Beer (ed.), *The decolonisation of the curriculum project: The affordances of indigenous knowledge for self-directed learning* (NWU Self-Directed Learning Series Volume 2), pp. 49–86, AOSIS, Cape Town. https://doi.org/10.4102/aosis.2019.BK133.03

De Beer, J., Petersen, N. & Dunbar-Krige, H., 2011, 'An exploration of the value of an educational excursion for pre-service teachers', *Journal of Curriculum Studies* 44(1), 89–110. https://doi.org/10.1080/00220272.2011.576771

De Beer, J., Petersen, N. & Van Vuuren, H.J. (eds.), 2020, 'Becoming a teacher: Research on the work-integrated learning of student teachers', in NWU Self-Directed Learning Series Volume 4, pp. i–431, AOSIS, Cape Town. https://doi.org/10.4102/aosis.2020.BK215

Deterding, S., 2014, 'The ambiguity of games: Histories and discourses of a gameful world', in S.P. Walz & S. Deterding (eds.), *The gameful world: Approaches, issues, applications*, pp. 23–64, MIT Press, Cambridge, MA.

Dichev, C. & Dicheva, D., 2017, 'Gamifying education: What is known, what is believed and what remains uncertain: A critical review', *International Journal of Educational Technology in Higher Education Nature Publishing Group* 14, 9.

Dignan, A., 2011, *Game frame. Using games as a strategy for success*, Free Press, New York, NY.

Edwards, A. & Protheroe, L., 2004, 'Teaching by proxy: Understanding how mentors are positioned in partnerships', *Oxford Review of Education* 30(2), 183–197. https://doi.org/10.1080/0305498042000215511

Ellis, V., McNicholl, J., Blake, A. & McNally, J., 2011, *The work of teacher education: Final research report for the higher education academy*, ESCalate Subject Centre for Education, Bristol.

Engeström, Y., 1987, *Learning by expanding: An activity-theoretical approach to developmental research*, Orienta-Konsultit, Helsinki.

Engeström, Y., 1999, 'Activity theory and individual and social transformation', in Y. Engeström, R. Miettinen, & R.L. Punama'ki (eds.), *Perspectives on activity theory*, Cambridge University Press, Cambridge.

Engeström, Y., 2016, *Studies in expansive learning: Learning what is not yet there*, pp. 234–257, Cambridge University Press, Cambridge.

Ericsson, K., 1993, 'The role of deliberate practice in the acquisition of expert performance', *Psychological Review* 100(3), 363–406. https://doi.org/10.1037/0033-295X.100.3.363

Festinger, L., 1962, *A theory of cognitive dissonance*, Stanford University Press, Stanford, CA.

Feuerstein, R., 1980, *Instructional enrichment intervention programme for cognitive modifiability*, University Park Press, Baltimore, MD.

Geoff, P., 2009, *Teaching today: A practical guide*, 4th edn., Nelson Thornes Ltd., Cheltenham.

Guskey, T.R., 2002, 'Professional development and teacher change', *Teachers and Teaching* 8(3), 381–391. https://doi.org/10.1080/135406002100000512

Hanus, M.D. & Fox, J., 2014, 'Assessing the effects of gamification in the classroom: A longitudinal study on intrinsic motivation, social comparison, satisfaction, effort, and academic performance', *Computers & Education* 80, 152–161. https://doi.org/10.1016/j.compedu.2014.08.019

Huang, W.H.Y. & Soman, D., 2013, 'Gamification of education', *Report Series: Behavioural Economics in Action* 29, 12.

Huizinga, J., 1955, *Homo ludens: A study of the play element in culture*, 1st Beacon Press paperback edn., Beacon Press, Boston, MA.

Kincheloe, J., 2008, *Critical pedagogy*, Primer Peter Lang, New York, NY.

Klock, A.C.T., Ogawa, A.N., Gasparini, I. & Pimenta, M.S., 2018, 'Does gamification matter? A systematic mapping about the evaluation of gamification in educational environments', in *Proceedings of the 33rd Annual ACM Symposium on Applied Computing*, New York, NY, United States of America, 2018, pp. 2006–2012.

Koivisto, J. & Hamari, J., 2019, 'The rise of motivational information systems: A review of gamification research', *International Journal of Information Management* 45, 191–210. https://doi.org/10.1016/j.ijinfomgt.2018.10.013

Landers, R.N., 2014, 'Developing a theory of gamified learning: Linking serious games and gamification of learning', *Simulation & Gaming* 45(6), 752–768.

Lawton, D., 1987, *The changing role of the teacher: Consequences for teacher education and training*, UNESCO, Paris.

Lee, J.J. & Hammer, J., 2011, 'Gamification in education: What, how, why bother?', *Academic Exchange Quarterly* 15, 1–5.

Majuri, J., Koivisto, J. & Hamari, J., 2018, 'Gamification of education and learning: A review of empirical literature', in *Proceedings of the 2nd International GamiFIN Conference*, Pori, Finland, May 21–23, 2018, n.p.

Makoelle, T.M. (ed.), 2016, *Inclusive teaching in South Africa*, Sun Press, Cape Town.

McAninch, A.R., 1991, 'Casebooks for teacher education: The latest fad or lasting contribution', *Journal of Curriculum Studies* 23(4), 345–355. https://doi.org/10.1080/0022027910230404

McNeil, L.M., 2013, *Contradictions of control: School structure and school knowledge*, Routledge, London.

Milik, O., 2017, 'Persona in MMO games: Constructing an identity through complex player/character relationships', *Persona Studies* 3(2), 66–78. https://doi.org/10.21153/ps2017vol3no2art672

Moon, B., 2014, *Time for radical change in teacher education guidelines: Using open and distance learning*, UNESCO, Paris.

Moyo, L. & Hadebe, L.B., 2018, 'The relevance of teacher education as a trajectory in developing and sustaining inclusivity in the digital classroom', *European Journal of Open Education and E-learning Studies* 3(1), 1–17.

Nauman, A.D., 2018, *Could it ever happen here? Reflections on Finnish education and culture*, Center for Practitioner Research at the National College of Education, National Louis University, Chicago, IL.

Nkabinde, Z.P., 1997, *An analysis of educational challenges in the new South Africa*, University Press of America, Inc., Boston, MA.

Ojose, B., 2011, 'Mathematics literacy: Are we able to put the mathematics we learn into everyday use?', *Journal of Mathematics Education* 4(1), 89–100.

Ortega Sánchez, D. & Gómez Trigueros, I.M., 2019, 'Gamification, social problems, and gender in the teaching of social sciences: Representations and discourse of trainee teachers', *PLoS One* 14(6), 1–19. https://doi.org/10.1371/journal.pone.0218869

Pagès J., 2005, 'Civic education, political education and teaching of social sciences, geography and of history', *Knowledge of Social Sciences, Geography and History* 44, 45–55.

Palomino, P.T., Toda, A.M., Dos Santos, W.O., Cristea, A.I. & Isotani, S., 2019, 'Narrative for gamification in education: Why should you care?', in *Proceedings of the 19th IEEE International Conference on Advanced Learning Technologies*, Maceió-AL, Brazil, July 15–18, n.p.

Petersen, N. & De Beer, J., 2019, 'The forest in my hand: Student teachers? Experiences of engaging in an educational excursion', in *Proceedings of Teaching and Education Conferences (No. 9611962)*, International Institute of Social and Economic Sciences, s.l., n.p.

Petty, G., 2006, *Evidence based teaching*, Nelson Thornes, Cheltenham.

Richtel, M., 2010, 'Growing up digital, wired for distraction', *The New York Times* 21, 1–11.

Roth, W.M. & Lee, Y.J., 2007, 'Vygotsky's neglected legacy: Cultural-historical activity theory', *Review of educational research* 77(2), 186–232. https://doi.org/10.3102/0034654306298273

Ryan, R.M. & Deci, E.L., 2000, 'Intrinsic and extrinsic motivations: Classic definitions and new directions', *Contemporary Educational Psychology* 25(1), 54–67.

Sannino, A.E., Daniels, H.E. & Gutiérrez, K.D., 2009, *Learning and expanding with activity theory*, Cambridge University Press, Cambridge.

Sarason, S.B., 2011, *You are thinking of teaching? Opportunities, problems, realities*, Jossey-Bass, San Francisco, CA.

Schultz, F. (ed.), 2013, *Education*, 30th edn., McGraw-Hill, New York, NY.

Seaborn, K. & Fels, D.I., 2014, 'Gamification in theory and action: A survey', *International Journal of Human-Computer Studies* 74, 14–31. https://doi.org/10.1016/j.ijhcs.2014.09.006

Sebotsa, T., Petersen, N. & Speight Vaughn, M., 2020, 'The role of work-integrated learning excursions in preparing student teachers for diverse classrooms and teaching social justice in South African classrooms', in J. de Beer, N. Petersen & H.J. van Vuuren (eds.), *Becoming a teacher: Research on the work-integrated learning of student teachers* (NWU Self-Directed Learning Series Volume 4), pp. 279–322, AOSIS, Cape Town. https://doi.org/10.4102/aosis.2020.BK215.10

Sedibe, M., 2011, 'Cultural diversity in a teacher training life orientation programme at a higher education institution (HEI), South Africa', *Journal of Social Sciences* 29(2), 171–176. https://doi.org/10.1080/09718923.2011.11892967

Shi, L., Cristea, A.I., Hadzidedic, S. & Dervishalidovic, N., 2014, 'Contextual Gamification of social interaction – Towards increasing motivation in social e-learning', *ICWL* 8613, 116–122. https://doi.org/10.1080/09718923.2011.11892967

Silva, D.L., Tadeo, M.C., Delos, R.V. & Dadigan, R.M., 2006, 'Factors associated with non-performing of Filipino students in mathematics: A vision of students cognitive and behaviour management', in *Proceedings of the 2ndIMT-GT Regional Conference on Mathematics Statistics and Application*, Universiti Sans Malaysia, Penang, 13th–15th June.

Smith, J., 2002, *The learning game: A teacher's inspirational story*, Abacus, London.

South Africa, 1996, *Constitution of the Republic of South Africa, 1996 (Act No. 108, 1996)*, President's Office Braille Services, Pretoria.

South Africa, 1997, *Citation of Constitutional Laws Act, 2005 (Act 5 of 2005)*, Government Printer, Pretoria.

Tella, A., 2008, 'Teacher variables as predictors of academic achievement of primary school pupils' mathematics', *International Electronic Journal of Elementary Education* 1(1), 17–33.

Toda, A.M., Klock, A.C., Oliveira, W., Palomino, P.T., Rodrigues, L., Shi, L. et al., 2019, 'Analysing gamification elements in educational environments using an existing Gamification taxonomy', *Smart Learning Environments* 6(1), 1–14. https://doi.org/10.1186/s40561-019-0106-1

Toda, A.M., Valle, P.H.D.D. & Isotani, S., 2018, 'The dark side of gamification: An overview of negative effects of gamification in education', in A. Mobasheri, J. Li & J. Nakahara Jr (eds.), *Communications in computer and information science*, vol. 832, pp. 143–156, Springer, Cham.

Tsui, A. & Law, D., 2007, 'Learning as boundary crossing in school university partnership', *Teaching and Teacher Education* 23(8), 1289–1301. https://doi.org/10.1016/j.tate.2006.06.003

Veresov, N., 2010, 'Introducing cultural historical theory: Main concepts and principles of genetic research methodology', *Cultural-Historical Psychology* 4, 83–90.

Vygotsky, L.S., 1978, *Mind in society: The development of higher psychological processes*, Harvard University Press, Cambridge, MA.

Wilson, V., 2014, 'Examining teacher education through cultural-historical activity theory', *Teacher Education Advancement Network Journal* 6(1), 20–29.

Zichermann, G. & Cunningham, C., 2011, *Gamification by design: Implementing game mechanics in web and mobile apps*, O'Reilly Media, Inc., Newton, MA.

Chapter 10

Anderson, K.T. & Kachorsky, D., 2019, 'Assessing students' multimodal compositions: An analysis of the literature', *English Teaching* 18(3), 312–334. https://doi.org/10.1108/ETPC-11-2018-0092

Baldwin, K.M., 2016, 'Multimodal assessment in action: What we really value in new media texts', PhD thesis, University of Massachusetts, Irvine, CA.

Berry, J. & Houston, K., 1995, 'Students using posters as a means of communication and assessment', *Educational Studies in Mathematics* 29(1), 21–27. https://doi.org/10.1007/BF01273898

Bezemer, J. & Kress, G., 2016, *Multimodality, learning and communication: A social semiotic frame*, Routledge, London.

Billington, H.L., 1997, 'Poster presentations and peer assessment: Novel forms of evaluation and assessment', *Journal of Biological Education* 31(3), 218–220. https://doi.org/10.1080/0021926 6.1997.9655566

Blum, M. & Barger, A., 2018, 'The CASPA model: An emerging approach to integrating multimodal assignments', *Journal of Educational Multimedia and Hypermedia* 27(3), 309–321.

Brown, S. & Knight, P., 1994, *Assessing learners in higher education*, Kogan Page Limited, London.

Canale, G., 2019, *Technology, multimodality and learning: Analyzing meaning across scales*, Palgrave Macmillan, Cham.

Conyers, V., 2003, 'Posters: An assessment strategy to foster learning in nursing education', *Journal of Nursing Education* 42(2), 38–41. https://doi.org/10.3928/0148-4834-20030101-09

Denysenko, V., Borysenko, N., Hrytsenko, I. & Sydorenko, N., 2020, 'Preparing the future educator to the creation of augmented reality excursions in local educational environments', *Information Technologies in Education* 4(45), 1–11. https://doi.org/10.14308/ite000736

Freire, P., 1970, *Pedagogy of the oppressed*, Seabury Press, New York, NY.

Fukuda, M., Huang, H.H., Kuwabara, K. & Nishida, T., 2019, 'Multimodal assessment on teaching skills in a virtual rehearsal environment', in *Proceedings of the 19th ACM International Conference on Intelligent Virtual Agents*, pp. 191–193, Association for Computing Machinery, New York, NY. https://doi.org/10.1145/3308532.3329449

Guffey, E.E., 2014, *Posters: A global history*, Reaktion Books, London.

Hafner, C.A. & Ho, W.Y.J., 2020, 'Assessing digital multimodal composing in second language writing: Towards a process-based model', *Journal of Second Language Writing* 47, 100710. https://doi.org/10.1016/j.jslw.2020.100710

Handron, D.S., 1994, 'Poster presentations: A tool for evaluating nursing students', *Nurse Educator* 19(1), 17–19. https://doi.org/10.1097/00006223-199401000-00009

Hassan, O., 2011, 'Learning theories and assessment methodologies – An engineering educational perspective', *European Journal of Engineering Education* 36(4), 327–339. https://doi.org/10.1 080/03043797.2011.591486

Havenga, M., 2016, 'Students' accountability and responsibility in problem-based learning: Enhancing self-directed learning', in E. Mentz & I. Oosthuizen (eds.), *Self-directed learning research*, pp. 72–98, AOSIS, Cape Town. https://doi.org/10.4102/aosis.2016.sdlr14.03

Hay, I. & Thomas, M., 1999, 'Making sense with posters in biological education', *Journal of Biological Education* 33(4), 209–214. https://doi.org/10.1080/00219266.1999.9655668

Howard, C., 2015, 'The role of posters as a means of summative assessment', *Worcester Journal of Teaching and Learning* 10, 1–5.

Hung, H.T., Chiu, Y.C.J. & Yeh, H.C., 2013, 'Multimodal assessment of and for learning: A theory-driven design rubric', *British Journal of Educational Technology* 44(3), 400–409. https://doi.org/10.1111/j.1467-8535.2012.01337.x

Jarvis, L. & Cain, J., 2003, 'Project report: Diversifying assessment 2: Posters and oral presentations in undergraduate history and science', *PRS-LTSN Journal* 2(2), 50–72. https://doi.org/10.5840/discourse20032225

Johnson, D.W. & Johnson R.T., 2014, 'Using technology to revolutionize cooperative learning: an opinion', *Frontiers in Psychology* 5, 1156. https://doi.org/10.3389/fpsyg.2014.01156

Kinikin, J. & Hench, K., 2012, 'Poster presentations as an assessment tool in a third/college level information literacy course: An effective method of measuring student understanding of library research skills', *Journal of Information Literacy* 6(2), 86–96. https://doi.org/10.11645/6.2.1698

Knowles, M., 1975, *Self-directed learning: A guide for learners and teachers*, Association Press, New York, NY.

Koç Akran, S. & Epçaçan, E., 2018, 'The effectiveness of the transformational learning model on the critical thinking tendency and on the meta-cognitive awareness of the students in the 6th grade science course', *Necatibey Faculty of Education Electronic Journal of Science and Mathematics Education* 12(2), 538–571. https://doi.org/10.17522/balikesirnef.506469

Kohnke, L., Jarvis, A. & Ting, A., 2021, 'Digital multimodal composing as authentic assessment in discipline-specific English courses: Insights from ESP learners', *TESOL Journal* 12(3), e600. https://doi.org/10.1002/tesj.600

Kress, G. & Van Leeuwen, T., 2001, *Multimodal discourse: The modes and media of contemporary communication*, Arnold, London.

Lubbe, A., 2015, 'Cooperative base groups in higher education: The impact on Life Sciences students' self-directed learning readiness', Master's dissertation, North-West University.

Lubbe, A., 2020, 'Cooperative learning-embedded assessment: Implications for students' assessment literacy and self-directedness in learning', PhD thesis, North-West University.

Lubbe, A. & Mentz, E., 2021, 'Self-directed learning-oriented assessment and assessment literacy: Essential for 21st century learning', in E. Mentz & A. Lubbe (eds.), *Learning through assessment: An approach towards self-directed learning* (NWU Self-Directed Learning Series Volume 7), pp. 1–26, AOSIS, Cape Town. https://doi.org/10.4102/aosis.2021.BK280.01

McGrail, E. & Behizadeh, N., 2017, 'K-12 multimodal assessment and interactive audiences: An exploratory analysis of existing frameworks', *Assessing Writing* 31, 24–38. https://doi.org/10.1016/j.asw.2016.06.005

McNamara, J., Larkin, I.K. & Beatson, A., 2010, 'Using poster presentations as assessment of work integrated learning', in *Proceedings of the Australian Collaborative Education Network National Conference*, Curtin University of Technology, Perth, September 29–01 October, n.p.

Menke, J.L., 2014, 'Implementation of online poster sessions in online and face-to-face classrooms as a unique assessment tool', *Journal of Chemical Education* 91(3), 414–416. https://doi.org/10.1021/ed400665n

Merriam, S.B., 2009, *Qualitative research: A guide to design and implementation*, Jossey-Bass, San Francisco, CA.

Merriam, S.B., Caffarella, R.S. & Baumgartner, L.M., 2007, *Learning in adulthood: A comprehensive guide*, 3rd edn., John Wiley & Sons, San Francisco, CA.

Okoro, C.O. & Chukwudi, E.K., 2011, 'Metacognitive strategies: A viable tool for self-directed learning', *Journal of Educational and Social Research* 1(4), 71–76.

Olivier, J., 2020a, 'Preface', in J. Olivier (ed.), *Self-directed multimodal learning in higher education* (NWU Self-Directed Learning Series Volume 5), pp. xxxi–xxxiv, AOSIS, Cape Town. https://doi.org/10.4102/aosis.2020.BK210.0p

Olivier, J., 2020b, 'Self-directed multimodal learning within a context of transformative open education', in J. Olivier (ed.), *Self-directed multimodal learning in higher education* (NWU Self-Directed Learning Series Volume 5), pp. 1–49, AOSIS, Cape Town. https://doi.org/10.4102/aosis.2020.BK210.01

References

Olivier, J., 2021, 'Self-directed multimodal assessment: Towards assessing in a more equitable and differentiated way', in E. Mentz & A. Lubbe (eds.), *Learning through assessment: An approach towards self-directed learning* (NWU Self-Directed Learning Series Volume 7), pp. 51–70, AOSIS, Cape Town.

O'Neill, G. & Jennings, D., 2012, *The use of posters for assessment: A guide for staff*, UCD Dublin, UCD Teaching and Learning/Resources, Dublin.

Race, P., 2015, *The lecturer's toolkit: A practical guide to assessment, learning and teaching*, 4th edn., Routledge, Abingdon.

Rannikmäe, M., Holbrook, J. & Soobard, R., 2020, 'Social constructivism – Jerome Bruner', in B. Akpan & T.J. Kennedy (eds.), *Science education in theory and practice*, pp. 259–275, Springer, Cham.

Rens, J., White, L. & Botha, L., 2020, 'The role of reflection as a vehicle for self-directed learning during work-integrated learning of student teachers', in J. de Beer, N. Petersen & H.J. van Vuuren (eds.), *Becoming a teacher: Research on the work-integrated learning of student teachers* (NWU Self-Directed Learning Series Volume 4), pp. 247–278, AOSIS, Cape Town. https://doi.org/10.4102/aosis.2020.BK215.09

Rogers, C.R., 1983, *Freedom to learn for the 80s*, Merrill, Columbus, OH.

Ross, A., Dlungwane, T. & Van Wyk, J., 2019, 'Using poster presentation to assess large classes: A case study of a first-year undergraduate module at a South African university', *BMC Medical Education* 19, 432. https://doi.org/10.1186/s12909-019-1863-9

Ross, J., Curwood, J.S. & Bell, A., 2020, 'A multimodal assessment framework for higher education', *E-Learning and Digital Media* 17(4), 290–306. https://doi.org/10.1177/2042753020927201

Saldaña, J., 2009, *The coding manual for qualitative researchers*, Sage, Los Angeles, CA.

Schunk, D.H., 2012, *Learning theories: An educational perspective*, 6th edn., Pearson, Boston, MA.

Silalahi, T.F. & Hutauruk, A.F., 2020, 'The Application of cooperative learning model during online learning in the pandemic period', *Budapest International Research and Critics Institute-Journal (BIRCI-Journal)* 3(3), 1683–1691. http://doi.org/10.33258/birci.v3i3.1100

Smith, A., Leeman-Munk, S., Shelton, A., Mott, B., Wiebe, E. & Lester, J., 2018, 'A multimodal assessment framework for integrating student writing and drawing in elementary science learning', *IEEE Transactions on Learning Technologies* 12(1), 3–15. https://doi.org/10.1109/TLT.2018.2799871

Smith, G.G., Sorensen, C., Gump, A., Heindel, A.J., Caris, M. & Martinez, C.D., 2011, 'Overcoming student resistance to group work: Online versus face-to-face', *Internet and Higher Education* 14(2), 121–128. https://doi.org/10.1016/j.iheduc.2010.09.005

Soetanto, D. & MacDonald, M., 2017, 'Group work and the change of obstacles over time: The influence of learning style and group composition', *Active Learning in Higher Education* 18(2), 99–113. https://doi.org/10.1177/1469787417707613

Tan, L., Zammit, K., D'warte, J. & Gearside, A., 2020, 'Assessing multimodal literacies in practice: A critical review of its implementations in educational settings', *Language and Education* 34(2), 97–114. https://doi.org/10.1080/09500782.2019.1708926

Tracy, S.J., 2020, *Qualitative research methods: Collecting evidence, crafting analysis, communicating impact*, John Wiley & Sons, Hoboken, NJ.

Trowler, V., 2010, *Student engagement literature review*, Higher Education Academy, York.

Vygotsky, L., 1978, *Mind in society*, Harvard University Press, London.

Windscheffel, R., 2019, 'Case study on posters and group work: Diversifying assessment on an MA in academic practice', *Educational Developments* 20(3), 13–16.

Wood, S.A., 2019, 'Multimodal pedagogy and multimodal assessment: Toward a reconceptualization of traditional frameworks', in S. Khadka & J.C. Lee (eds.), *Bridging the multimodal gap: From theory to practice*, pp. 244–262, Utah State University Press, Logan, UT.

Anderson, T., Rourke, L., Garrison, D.R. & Archer, W., 2001, 'Assessing teaching presence in a computer conference context', *Journal of Asynchronous Learning Networks* 5(2), n.p.

Chapter 11

Byun, J. & Cardenas, J., 2013, 'A study of online presence in digital learning environments', in *Proceedings of the 19th Americas Conference on Information Systems*, Chicago, IL, August 15–17, 2013, n.p.

Conley, L. & Du Plessis, P., 2015, 'The teacher as a classroom manager', in S. Gravett, J. De Beer & E. Du Plessis (eds.), *Becoming a teacher: Second edition*, pp. 183–210, Pearson, Cape Town.

Craven, M.M., 2020, 'Syncing with students: Valuable qualities of synchronous online teaching', viewed 03 October 2021, https://www.facultyfocus.com/articles/online-education/online-student-engagement/syncing-with-students-valuable-qualities-of-synchronous-online-teaching/

De Beer, J. & Henning, E., 2011, 'Retreating to a Vygotskian stage where pre-service teachers play out social, dramatical collisions', *Acta Academica* 43(4), 203–228.

De Beer, J., Petersen, N. & Dunbar-Krige, H., 2012, 'An exploration of the value of an educational excursion for pre-service teachers', *Journal of Curriculum Studies* 44(1), 89–110. https://doi.org/10.1080/00220272.2011.576771

De Beer, J., Smith, U. & Jansen, C., 2009, 'Situated in a separated campus – Students' sense of belonging and academic performance: A case study of the experiences of students during a higher education merger', *Education as Change* 13(1), 167–194. https://doi.org/10.1080/16823200902944922

De Beer, J., Van der Walt, M. & Bunt, B., 2020, 'The affordances of case-based teaching that draws on drama in pre-service teacher education', in J. de Beer, N. Petersen & H.J. van Vuuren (eds.), *Becoming a teacher: Research on the work-integrated learning of student teachers* (NWU Self-Directed Learning Series Volume 4), pp. 189–214, AOSIS, Cape Town. https://doi.org/10.4102/aosis.2020.BK215.07

Fiock, H., 2020, 'Designing a community of inquiry in online courses', *International Review of Research in Open and Distributed Learning* 21(1), 135–152. https://doi.org/10.19173/irrodl.v20i5.3985

Garrison, D.R., Anderson, T. & Archer, W., 2000, 'Critical inquiry in a text-based environment: Computer conferencing in higher education', *The Internet and Higher Education* 2(2–3), 87–105. https://doi.org/10.1016/S1096-7516(00)00016-6

King, N., Thomas, K., Martin, N., Bell, D. & Farrell, S., 2005, 'Now nobody falls through the net: Practitioners' perspectives on the Gold Standards Framework for community palliative care', *Palliative Medicine* 19(8), 619–627. https://doi.org/10.1191/0269216305pm1084oa

Kounin, J., 1970, *Discipline and group management in classrooms*, Holt, Rinehart, and Winston, New York, NY.

Maestos, R., Vaguera, G.S. & Zehr, L.M., 2007, 'Factors impacting sense of belonging at a Hispanic-serving institution', *Journal of Hispanic Higher Education* 6(3), 237–256. https://doi.org/10.1177/1538192707302801

Munoz, K.E., Wang, M.J. & Tham, A., 2021, 'Enhancing online learning environments using social presence: Evidence from hospitality online courses during COVID-19', *Journal of Teaching in Travel and Tourism*, viewed https://www.tandfonline.com/loi/wttt20

Muth, J., 1962, *Padagogischer Takt*, Verslagsgesellschaft, Essen.

Notar, C.E. & Sorbet, S.R., 2020, 'Withitness in the e-learning', *Technium Social Sciences Journal* 10, 58–78. https://doi.org/10.47577/tssj.v10i1.1212

Petersen, N., De Beer, J. & Mentz, E., 2020, 'The first-year student teacher as a self-directed learner', in J. de Beer, N. Petersen & H.J. van Vuuren (eds.), *Becoming a teacher: Research on the work-integrated learning of student teachers* (NWU Self-Directed Learning Series Volume 4), pp. 115–155, AOSIS, Cape Town. https://doi.org/10.4102/aosis.2020.BK215.05

Sebotsa, T., Petersen, N. & Speight Vaughn, M., 2020, 'The role of work-integrated learning excursions in preparing student teachers for diverse classrooms and teaching social justice in South African classrooms', in J. de Beer, N. Petersen & H.J. van Vuuren (eds.), *Becoming a teacher:*

Research on the work-integrated learning of student teachers (NWU Self-Directed Learning Series Volume 4), pp. 279–322, AOSIS, Cape Town. https://doi.org/10.4102/aosis.2020.BK215.10

Sipman, G., Thölke, J., Martens, R. & McKenney, S., 2019, 'The role of intuition in pedagogical tact: Educator views', *British Educational Research Journal* 45(6), 1186–1202. https://doi.org/10.1002/berj.3557

Taljaard, S., 2018, 'The value of an excursion in the professional development of pre-service teacher education students', unpublished PhD thesis, University of Johannesburg.

University of Huddersfield, n.d., *Defining themes and codes*, viewed 02 October 2021, https://research.hud.ac.uk/research-subjects/human-health/template-analysis/technique/themes-and-codes/

Van der Wolf, K. & Van Beukering, T., 2011, *Gedragsproblemen in scholen: Het denken en handelen van leraren* [Behavioural problems in schools: The thoughts and actions of teachers], Uitgeverij Acco, Leuven.

Van Manen, M., 2015, *Pedagogical tact: Knowing what to do when you don't know what to do*, Routledge, New York, NY.

Van Wart, M., Medina, A.N., Canelon, J., Kordrostami, M., Zhang, J. & Liu, Y., 2020, 'Integrating students' perspectives about online learning: A hierarchy of factors', *International Journal of Educational Technology in Higher Education* 17(53), 1–22. https://doi.org/10.1186/s41239-020-00229-8

Veresov, N., 2004, 'Zone of proximal development (ZPD): The hidden dimension?', in A. Ostern & R. Heila-Ylikallio (eds.), *Sprak som kultur* [Language as culture], vol. 1, pp. 13–30, Vasa, s.l.

Vygotsky, L.S., 1978, *Mind in society*, Harvard University Press, London.

Chapter 12

ARB Code, 2021, *Code of advertising practice*, viewed 21 October 2021, http://arb.org.za/assets/preface-v2021.1.pdf.

Bai, Q., Dan, Q., Mu, Z. & Yang, M., 2019, 'A systematic review of emoji: Current research and future perspectives', *Frontiers in Psychology* 10(Article 2221), 1–16. https://doi.org/10.3389/fpsyg.2019.02221

Bakir, N. & Phirangee, K., 2021, 'Zooming into a community: Exploring various teaching practices to foster sense of community and engagement in emergency remote teaching', *Journal of Teaching and Learning with Technology* 10(Special Issue), 386–389. https://doi.org/10.14434/jotlt.v9i2.31226

Blignaut, n.d., *The John Maxwell team transformational coaching & mentoring*, viewed 20 October 2021, https://dion.coach.

Borg, M., 2004, 'The apprenticeship of observation', *ELT Journal* 58(3), 274–276. https://doi.org/10.1093/elt/58.3.274

Bosch, C. & Laubscher, D., 2020, 'Lessons learnt in establishing a teaching presence in a cooperative blended learning environment: Facilitators' perspectives', in E. Mentz & R. Bailey (eds.), *Self-directed learning research and its impact on educational practice* (NWU Self-Directed Learning Series Volume 3), pp. 115–154, AOSIS, Cape Town. https://doi.org/10.4102/aosis.2020.BK206.04

Bosch, C., Laubscher, D.J. & Olivier J., 2020, 'The affordances of the Community of Inquiry framework for self-directed blended learning in South African research', in J. Olivier (ed.), *Self-directed multimodal learning in higher education* (NWU Self-Directed Learning Series Volume 5), pp. 51–92, AOSIS, Cape Town. https://doi.org/10.4102/aosis.2020.BK210.02

Bosch, C., Mentz, E. & Reitsma, G.M., 2019, 'Integrating cooperative learning into the combined blended learning design model: Implications for students' intrinsic motivation', *International Journal of Mobile and Blended Learning* 11(1), 58–73. https://doi.org/10.4018/IJMBL.201901010

Brown, B., Schroeder, M. & Eaton, S., 2016, 'Designing synchronous online interactions and discussions', Paper Presented at IDEAS 2016: Designing of Innovation Selected Proceedings, University of Calgary, Canada, May 18–20 May, pp. 51–60.

Campbell, J., 2014, *Quality law graduates preferred to large number of ill-equipped graduates*, viewed 31 October 2021, https://www.ru.ac.za/law/latestnews/newsarchive/2014news/quality lawgraduatespreferredtolargenumbersofill-equippedgraduates.html

Chen, X. & Siu, K.W.M., 2017, 'Exploring user behavior of emoticon using among Chines youth', *Behaviour & Information Technology* 36(6), 637–649.

Cohen, B.D., 2006, 'Helping students develop more humanistic philosophy of lawyering', *Legal Writing: The Journal of the Legal Writing Institute* 12, 141–172.

Danaher, P.A., Hickery, A., Brown, A. & Conway, J.M., 2007, 'Exploring elements for creating an online community of learners within a distance education course at the University of Southern Queensland', in R. Luppicini (ed.), *Online learning communities*, pp. 219–240, Information Age Publishing, Charlotte, NC.

De Beer, J., 2019, 'The importance of context for self-directed learning', in E. Mentz, J. De Beer & R. Bailey (eds.), *Self-Directed Learning for the 21st century: Implications for higher education* (NWU Self-Directed Learning Series Volume 1), pp. 103–131, AOSIS, Cape Town. https://doi.org/10.4102/aosis.2019.BK134.04

Dengler, M., 2008, 'Classroom active learning complemented by an online discussion forum to teach sustainability', *Journal of Geography in Higher Education* 32(3), 481–494. https://doi.org/10.1080/03098260701514108

Golden Fried Chicken (Pty) Ltd v Sandile Cele (ruling of the Final Appeals Committee of the Advertising Regulatory Board of 10 July 2019), viewed 20 October 2021 http://arb.org.za/assets/fac-decision-re-chicken-licken-vs-sandile-cele.pdf

Goodenow, C., 1993, 'Classroom belonging among early adolescent students: Relationships to motivation and achievement', *The Journal of Early Adolescence* 13(1), 21–43. https://doi.org/10.1177/0272431693013001002

Hamilton, N.W., 2015, 'Professional formation with emerging adult students in the 21–29 age group: Engaging students to take ownership of their own professional development toward both excellence and meaningful employment', *Journal of the Professional Lawyer* 2015, 125–156.

Heinrich, D., 2015, 'Teaching and assessing professional communication skills in law school', *North Dakota Law Review* 91(1), 99–130.

Hmelo-Silver, C.E., 2004, 'Problem-based learning: What and how do students learn?', *Educational Psychology Review* 16(3), 235–266.

Jackson, P., Cashmore, A. & Scott, J., 2010, *Sense of belonging: Background literature*, viewed 25 October 2021, https://www2.le.ac.uk/offices/ssds/projects/student-retention-project/dissemination/papers-and-publications/Sense%20of%20Belonging%20Lit%20Review.docx/view

Johnson, D.W. & Johnson, R.T., 2009, 'An educational psychology success story: Social interdependence theory and cooperative learning', *Educational Researcher Review* 38(5), 365–379. https://doi.org/10.3102/0013189X093390

Keegan, D., 1986, 'Interaction and communication', in D. Keegan (ed.), *The foundations of distance education*, Croom Helm, Kent, UK, pp. 89–107.

Kiesler, S., 1986, 'The hidden message in computer networks', *Harvard Business Review* 64(1), 46–60.

Koraan, R., 2017, 'Student-centred problem-based learning as a transformative approach to legal education', *The Independent Journal of Teaching and Learning* 12(1), 104–113.

Knowles, M.S., 1975, *Self-directed learning*, Association Press, New York, NY.

Kurtz, S., Wylie, M. & Gold, N., 1990, 'Problem-based learning: An alternative approach to legal education', *Dalhousie Law Journal* 13, 797–816.

Laubscher, D., Bailey, R., Bergamin, P. & Van der Westhuizen, C., 2019, 'A teaching-learning framework for adaptive instruction using cooperative learning and Socratic questioning to promote self-directed learning: A systematic literature review', in E. Mentz, J. de Beer & R. Bailey (eds.), *Self-Directed Learning for the 21st century: Implications for higher education* (NWU Self-Directed Learning Series Volume 1), pp. 239–282, AOSIS, Cape Town. https://doi.org/10.4102/aosis.2019.BK134.08

Law, Y.K., 2011, 'The effects of cooperative learning on enhancing Hong Kong fifth graders' achievement goals, autonomous motivation and reading proficiency', *Journal of Research in Reading* 34(4), 402–425. https://doi.org/10.1111/j.1467-9817.2010.01445.x

Lizzio, A.J., 2011, *Succeeding@Griffith: Next generation partnerships across the student lifecycle,* viewed 18 October https://www.griffith.edu.au/learning-teaching/stu%20dent-success/first-year-experience/student-lifecycle-transition-orientation

Loewen, G. & Pollard, W, 2010, 'The social justice perspective', *Journal of Postsecondary Education and Disability* 23(1), 5–18.

Loncar, M., Barrett, N.E. & Liu, G.-Z., 2014, 'Towards the refinement of forum and asynchronous online discussion in educational contexts worldwide: Trends and investigative approaches within a dominant research paradigm', *Computers & Education* 73(2014), 93–110. https://doi.org/10.1016/j.compedu.2013.12.0

Lortie, D. 1975, *Schoolteacher: A sociological study*, University of Chicago Press, London, UK.

Lo, S.K., 2008, 'The nonverbal communication functions of emoticons in computer-mediated communication', *Cyberpsychology Behaviour* 11, 595–597. https://doi.org/10.1089/cpb.2007.0132

LSSA LEAD, n.d., *Message to law students*, viewed 27 October 2021, https://www.lssalead.org.za/about-us/law-students/message-to-law-students/#

Madison, B. & Gantt, L., 2019, 'Morals and mentors: What the first American law schools can teach us about developing law students' professional identity', *Regent University Law Review* 31(2), 161–208. https://doi.org/10.2139/ssrn.3403014

Marjan, L., & Peyman, S., 2012, 'Lifelong learning; why do we need it?', *Procedia – Social and Behavioral Sciences* 31, 399–403. https://doi.org/10.1016/j.sbspro.2011.12.073

Martin, F. & Parker, P.A., 2014, 'Use of synchronous virtual classrooms: Why, who, and how?', *Journal of Online Learning and Teaching* 10(2), 192–210.

Maxwell, J.C., 2012, *The 15 invaluable laws of growth*, Center Street, New York, NY.

McConnell, D., 2013, *Implementing computer supported cooperative learning*, 2nd edn., Routledge, New York, NY.

McKenzie, K.B., Christman, D.E., Hernandez, F., Fierro, E., Copper, C.A., Dantley, M. et al., 2008, 'A proposal for educating leaders for social justice', *Education Administration Quarterly* 44(1), 111–138. https://doi.org/10.1177/0013161X07309470

Mentz, E. & Bailey, R., 2019, 'A systematic review of research on the use of technology-supported cooperative learning to enhance self-directed learning', in E. Mentz, J. de Beer & R. Bailey (eds.), *Self-Directed Learning for the 21st century: Implications for higher education* (NWU Self-Directed Learning Series Volume 1), pp. 203–238, AOSIS, Cape Town. https://doi.org/10.4102/aosis.2019.BK134.07.

NWU, n.d., *Law home*, viewed 24 October 2021, https://law.nwu.ac.za.

Ozkara, B.,O., & Cakir, H., 2018, 'Participation in Online Courses from the Students' Perspective', *Interactive Learning Environments* 26(7), 924-942. https://www.tandfonline.com/doi/full/10.1080/10494820.2017.1421562.

Peacock, S., Cowan, J., Irvine, L., Williams, J., 2020, 'An exploration into the importance of a sense of belonging for online learners', *International Review of Research in Open and Distributed Learning* 21(2), 18–35. https://doi.org/10.19173/irrodl.v20i5.4539

Peper, E., Wilson, V., Marc, M., Rosegard, E. & Harvey, R., 2021, 'Avoid zoom fatigue, be present and learn', *NeuroRegulation* 8(1), 47–56. https://doi.org/10.15540/nr.8.1.47

Peterson, M., 1997, 'Skills to enhance problem-based learning', *Medical Education Online* 2(1), 4289. https://doi.org/10.3402/meo.v2i.4289

Polden, D.J., 2008, 'Educating law students for leadership and responsibilities', *University of Toledo Law Review* 39, 353–360.

Posner, B.Z., 2018, 'Leadership development in law schools: Myths, principles, and practices', *Santa Clara Law Review* 58, 399–409.

Quinot, G. & Van Tonder, S.P., 2014, 'The potential of capstone learning experiences in addressing perceived shortcomings in the LLB training in South Africa', *Potchefstroom Electronic Law Journal* 17(4),1350–1390. https://doi.org/10.4314/pelj.v17i4.05

Schmidt, H.G., 1993, 'Foundations of problem-based learning: Some explanatory notes', *Medical Education* 27, 422–432. https://doi.org/10.1111/j.1365-2923.1993.tb00296.x

Slough, T.L. & Bormann, J.M., 2011, 'Field trip to Racetrack enhances classroom experience', *NACTA Journal* 55(4), 59–64, viewed 02 October 2021 http://www.jstor.org/stable/nactajournal.55.4.59

Smagorinsky, P. & Barnes, M., 2014, 'Revisiting and revising the apprenticeship of observation', *Teacher Education Quarterly* 41(4), 29–52.

Stevenson, A. (ed.), 2015, *Oxford Dictionary of English*, 3rd edn., Oxford University Press, Oxford.

Tyler, T.R., 2000, 'Social justice: "Outcome and procedure"', *International Journal of Psychology* 35(2), 117–125. https://doi.org/10.1080/002075900399411

Tyler, T.R. & Smith, H.J., 1995, *Social justice and social movements*, working paper series 3, 4, viewed 4 October 2021 http://irle.berkeley.edu/workingpapers/61-95.pdf

Walther, B.J., 1996, 'Computer-mediated communication: Impersonal, and hyperpersonal interaction', *Communication Research* 32(1), 3–43. https://doi.org/10.1177/009365096023001001

Yeh, Y.-C., 2009, 'Integrating e-learning into the direct-instruction model to enhance the effectiveness of critical-thinking instruction', *Instructional Science* 37(2), 185–203. https://doi.org/10.1007/s11251-007-9048

Chapter 13

Beligatamulla, G., Rieger, J., Franz, J. & Strickfaden, M., 2019, 'Making pedagogic sense of design thinking in the higher education context', *Open Education Studies* 1(1), 91–105. https://doi.org/10.1515/edu-2019-006

Bennet, S., Agostinho, S. & Lockyer, L., 2016, 'Investigating university educators' design thinking and the implications for design support tools', *Journal of Interactive Media in Education* 1(9), 1–10.

Botha-Ravyse, C., Crichton, S., Moss, S. & Hanekom, S.M.H., 2018, *Design thinking as an approach to develop sustainable physical activity and nutrition interventions in low re-sourced settings*, EasyChair print, 248, June 11, Easychair.org, University of British Columbia, Vancouver.

Bowen, T., 2018, 'Becoming professional: Examining how WIL students learn to construct and perform their professional identities', *Studies in Higher Education* 43(7), 1148–1159. https://doi.org/10.1080/03075079.2016.1231803

Coll, R.K. & Zegwaard, K.E., 2006, 'Perceptions of desirable graduate competencies for science and technology new graduates', *Research in Science & Technological Education* 24(1), 29–58. https://doi.org/10.1080/02635140500485340

Crichton, S., 2018, *Design thinking*, Centre for Health Professions Education Workshop 1, viewed 16 October 2019, https://dschool.stanford.edu/resources

Dam, R.I. & Siang, T.Y., 2020, *Stage 3 in the design thinking process: Ideate*, Interaction Design Foundation, viewed 28 September 2021, https://www.interaction-design.org/literature/topics/design-thinking

De Beer, J., Petersen, N. & Dubar-Krige., H., 2011, 'An exploration of the value of an educational excursion for pre-service teachers', *Journal of Curriculum Studies* 44(1), 89–110. https://doi.org/10.1080/00220272.2011.576711

Elwood. K., Savenye, W., Jordan, M.E., Larson, J. & Zapata, C., 2016, 'Design thinking: A new construct for educators', *Proceedings 39th Annual Convention of the Association for Educational Communications and Technology*, Las Vegas, Nevada, pp. 1–162, viewed 30 October 2021, https://files.eric.ed.gov/fulltext/ED579661.pdf

Eris, O., 2003, 'Asking generative design questions: A fundamental cognitive mechanism in design thinking', *International Conference on Engineering Design*, Iced 03, Stockholm, August 19–21.

Ferdig, R.E. & Pytach, K.E., 2021, *What teacher educators should have learned from 2021*, Association for the Advancement of Computing in Education, Waynesville, NC.

Gambrill, E. & Gibbs, L., 2009, *Critical thinking for helping professionals: A skills-related workbook*, 3rd edn., Oxford, New York, NY.

Hamat, A. & Embi, A.M., 2010, 'Constructivism in the design of online learning tools', *European Journal of Educational Studies* 2(3), 237–246.

Hasso Plattner Institute of Design at Stanford University, 2021, *Getting started with design thinking*, viewed 24 November 2021, https://dschool.stanford.edu/resources/getting-started-with-design-thinking

Kateb, F. & Allahdadi, M., 2018, 'Design thinking: Its power in designing better', Paper Presented at the International Congress on Marketing and Design. Intersections and Challenges. Faro Portugal, October 18–19.

Kaur, M., 2021, 'Design thinking: A new way of thinking', *International Journal of Social Sciences* 9(1), 11–13.

Levinson, D., 1986, 'A conception of adult development', *American Psychologist* 41(1), 3–13. https://doi.org/10.1037/0003-066X.41.1.3

Lortie, C.D., 1975, *Schoolteacher: A sociological study*, University of Chicago Press, Chicago.

Luka, I., 2014, 'Design thinking in pedagogy', *Journal of Education Culture and Society* 5(2), 63–74. https://doi.org/10.15503/jecs20142.63.74

Marra, L.R., Stanton-Nichols, L., Hong, Y., Gottschild, K., Pirzadeh, I. & Stamatis, S., 2018, 'Design thinking as a strategic planning tool for adapted physical activity programs within a university setting', *Palaestra* 32(4), 15–21.

Mewborn, D.S. & Tyminski, A.M., 2006, 'Lortie's apprenticeship of observation revisited', *For the Learning of Mathematics* 26(3), 23–32.

Notar, C.E. & Sorbet, S.R., 2020, 'Withitness in the eLearning', *Technium Social Sciences Journal* 10, 58–78.

Pande, M. & Bharathi, S.V., 2020, 'Theoretical foundations of design thinking – A constructivism learning approach to design thinking', *Thinking Skills and Creativity* 36, 1–17. https://doi.org/10.1016/j.tsc.2020.100637

Phirangee, K. & Malec, A., 2017, 'Othering in online learning: An examination of social presence, identity, and sense of community', *Distance Education* 38(2), 160–172. https://doi.org/10.1080/0587919.2017.1322457

Pusca, D. & Northwoord, D., 2018, 'Design thinking and its application to problem solving', *Global Journal of Engineering Education* 20(1), 48–53.

Razzouk, R. & Shute, V., 2012, 'What is design thinking and why is it important?', *Review of Educational Research* 82(3), 330–348. https://doi.org/10.3102/0034654312457429

Sandars, J. & Goh, P.-S., 2020, 'Design thinking in medical education: The key features and practical application', *Journal of Medical Education and Curricular Development* 7, 1–5. https://doi.org/10.1177/2382120520926518

Schaeper, H., 2020, 'The first year in higher education: The role of individual factors and the learning environment for academic integration', *Higher Education* 79, 95–110. https://doi.org/10.1007/s10734-019-00398-0

Slater, N.A., Dhanasekaran, M. & Govindarajulu, M., 2020, 'Design thinking in pharmacy education: The future of classroom preparation', *New Directions for Teaching and Learning* 162(Summer), 113–121. https://doi.org/10.1002/tl.20396

Wolcott, M.D. & McLaughlin, J.E., 2020, 'Promoting creative problem-solving in schools of pharmacy with the use of design thinking', *American Journal of Pharmaceutical Education* 84(10), 1271–1276. https://doi.org/10.5688/ajpe8065

Index

The book is devoted to scholarship in the field of pre-service teacher education, with a specific focus on research into the enhancement of self-directed learning (SDL), and contributes to the discourse on creating a disposition towards self-directed learning during the social and academic integration of first-year students within higher education institutions. Two chapters also deal with research on the development of self-directed learning and nuanced understandings of the chosen professions of Law and Health Sciences students. The target audience is scholars working in the fields of teacher education, self-directed learning, engaging pedagogies, problem-based learning, cooperative learning and gamification. Whereas social constructivist learning theory served as overarching theoretical framework for the virtual excursions, the various chapters in the book also draw on other secondary theories, such as self-determination theory, social interdependence theory, gender theory and the 'withitness' model of Kounin.

◆

The everlasting endeavour to address effective teaching and learning in higher education institutions' (HEI) teacher education programmes, ensuring well-trained teachers for the future, is emphasised in this book. The COVID-19 pandemic impacted teaching and learning in unmeasurable ways over the past months. Self-directed learning in the era of the COVID-19 pandemic: Research on the affordances of online virtual excursions is a timeous collection of research work that is much needed in current debates on SDL and how to best approach the praxis of teaching and learning considering the challenges faced by South African educators during a pandemic such as COVID-19. The manuscript comprises a collection of various experts' work, and scholarship, in the field of student (teacher) training. The design-based, mixed-methods research focuses on SDL and the affordances of online virtual excursions in three faculties: Education, Law and Health Sciences. This collective work presents new ideas from research findings to address the challenges surrounding online teaching and learning. Arguments for innovative strategies, such as virtual excursions, to address the quest for quality teaching and learning in an era of a pandemic are presented. Through this collective work, the researchers present new ideas from their findings on how to best prepare the new generation student (teacher) cohort for an unknown future. In conclusion, the manuscript juxtaposes the affordances of face-to-face and virtual excursions, and showing the affordances of both face-to-face and online student excursions in terms of promoting SDL and an emerging professional identity.

**Dr Marie-Louise Botha, Department of Curriculum Studies,
Faculty of Education, Stellenbosch University, Stellenbosch, South Africa**