



# Transformation of learning and teaching in rehabilitation sciences

A case study from South Africa

Edited by Dawn V. Ernstzen,  
Lee-Ann J. Jacobs-Nzuzi Khuabi & Faeza Bardien

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Volume 2

# **Transformation of learning and teaching in rehabilitation sciences**

**A case study from South Africa**



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Human Functioning, Technology and Health Book Series  
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# **Transformation of learning and teaching in rehabilitation sciences**

**A case study from South Africa**

**EDITORS**

**Dawn V. Ernstzen**

**Lee-Ann J. Jacobs-Nzuzi Khuabi**

**Faeza Bardien**



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## Research justification

This book focuses on learning and teaching in rehabilitation sciences in an African context. This book is the second volume in the book series, 'Health, Functioning and Technology', and brings together the key themes of the series by focusing on how education can impact health and functioning through various innovative methods, including the use of technology. In this book, we discuss local contextual drivers for renewing rehabilitation professions curricula that support graduates to become competent, socially accountable and adaptable to change.

Recently, the higher education sector has undergone tremendous challenges and changes that congruently shaped teaching, learning and assessment in health and rehabilitation sciences. Many of these developments preceded the international coronavirus disease of 2019 (COVID-19) pandemic; however, the pandemic and consequent lockdown challenged health care professions' curriculum planning and delivery. The challenges confirmed the need to reconceptualise health professions education to enable graduates to be professionally and clinically competent and, moreover, to be socially accountable and confident.

The foundational element of the chapters in the book is the local South African context and evidence-informed educational practice to make curricula contextually and globally relevant. We include the impact of the COVID-19 pandemic on learning, teaching, student support and the integration of technology to assist in achieving the goals of curricula. Through the different themes of the book, namely, near-peer teaching, technology-enhanced education, clinical education and curriculum renewal, we cover key topics on responsive curricula, interprofessional education, clinical competence, peer-assisted learning, learning technologies, student support, and emergency remote teaching and learning (ERTL).

The value of the book is that it examines critical and relevant topics to advance tailored and contextually relevant, innovative and evidence-informed solutions for rehabilitation education in an African context. The chapters in this book answer critical questions about curriculum reform to develop an engaging and dynamic curriculum, transformative learning and learning using technology to enable graduates to become leaders in health care management. The book paves the way for educational change for the professional and personal development of students in rehabilitation.

The book was a collaboration within the Department of Health and Rehabilitation Sciences (DHRS) at the Faculty of Medicine and Health Sciences, Stellenbosch University. The department constitutes the Division of Occupational Therapy, the Division of Physiotherapy and the Division of Speech-Language and Hearing Therapy. A strength of the book is that it is written from diverse perspectives, optimally utilising the knowledge base in three different professions, with participation from health professions educationalists. The book is written for scholars and intended to be used by scholars, including researchers and educators in health sciences. The content of the book includes information generated by health professions educators and undergraduate students (i.e. Chapter 6). A range of different methodologies were used in the 10 chapters of the book, comprising primary and secondary methodological approaches (scoping reviews, qualitative studies, descriptive studies, surveys, case studies, document review, experimental and mixed method designs). The book contains original research, and any material reproduced in this book has been appropriately referenced. Permission was obtained for the reproduction of material, where applicable. We declare that the material in this book has not been plagiarised from any source(s), which we confirmed by using anti-plagiarism software.

**Professor Dawn V. Ernstzen**, Department of Health and Rehabilitation Sciences, Faculty of Medicine and Health Sciences, Stellenbosch University, Cape Town, South Africa.



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# Abbreviations and acronyms, boxes, figures and tables appearing in the text and notes

## List of abbreviations and acronyms

ASHA	American Speech-Language-Hearing Association
CALD	cultural and linguistic diversity
CBE	community-based education
CCP	Collaborative Care Project
CHPE	Centre for Health Professions Education
CLD	culturally and linguistically diverse
CPGs	clinical practice guidelines
COVID-19	coronavirus disease of 2019
DHRS	Department of Health and Rehabilitation Sciences
DoH	Department of Health
EBP	evidence-based practice
EBR	evidence-based rehabilitation
ERTL	emergency remote teaching and learning
EWC	Every Word Counts
FAIMER	Foundation for the Advancement of International Medical Education and Research
FGD	focus group discussion
FMHS	Faculty of Medicine and Health Sciences
FUSPE	<i>Fisioterapie Universiteit Stellenbosch Praktiese Eksamen</i>
HD	high-definition
HEI	higher education institution
HIV	human immunodeficiency virus
HPCSA	Health Professions Council of South Africa
HREC	Health Research Ethics Committee
ICC	Interclass Correlation Coefficient
ICF	International Classification of Functioning, Disability and Health
IPCP	interprofessional education collaborative practice

IPE	interprofessional education
IPECP	interprofessional education and collaborative practice
IPL	interprofessional learning
KTA	Knowledge-to-Action
LGBTQI+	lesbian, gay, bisexual, transgender, queer and intersex
LMIC	low- and middle-income countries
LMS	learning management system
MeSH	medical subject heading
NPAL	near-peer assisted learning
NPT	near-peer teaching
NQF	National Qualifications Framework
NRF	National Research Foundation
OSPE	Objective Structured Practical Examination
OT	Occupational Therapy
OTASA	Occupational Therapy Association of South Africa
PAL	peer-assisted learning
PHC	primary health care
PIO	population, intervention, outcome
PMI	plus, minus, interesting
PoPIA	<i>Protection of Personal Information Act 4 of 2013</i>
PROGRESS-Plus	place of residence, race/ethnicity, occupation, gender, religion, education, social capital, socio-economic status; plus age, disability and sexual orientation
PT	physiotherapy
PU	peri-urban
Q&A	question-and-answer
R	rural
RCT	randomised controlled trial
REF	student reflections
RM	research methodology
RSA	Republic of South Africa
SAFRI	Saharan Africa-FAIMER Regional Institute
SD	standard deviation (also denoted as $\pm$ )
SDH	social determinants of health
SLHT	speech-language and hearing therapy
SLP	speech-language pathologist
SLT	speech-language therapy
SOP	standard operating procedures
SR	systematic review

SUN	Stellenbosch University
SUTI	Stellenbosch University Telerehabilitation Initiative
TAU	Teaching Advancement at Universities
U	urban
UCT	University of Cape Town
UG	undergraduate
UGs	undergraduates
UK	United Kingdom
UP	University of Pretoria
USA	United States of America
UKZN	University of KwaZulu-Natal
UWC	University of the Western Cape
WHO	World Health Organization
WFOT	World Federation of Occupational Therapy

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Monique Visser is a lecturer in the Division of Speech-Language and Hearing Therapy at SUN. After graduating as a speech-language therapist from SUN, she completed her community service year in the Northern Cape. Prior to joining SUN permanently in 2008, she was involved on a part-time basis as a research assistant and clinical tutor while working in private practice. Visser obtained her MA in Speech Pathology (SUN) in 2011 and her MPhil in Health Professions Education (SUN) in 2018. She has 15 years of experience as lecturer and clinical educator in the fields of early literacy, language disorders, and articulation and phonology. She served as the programme coordinator for the Bachelor of Speech-Language and Hearing Therapy degree for four years. After completing the MPhil degree through the CHPE, she joined the integrated portfolio module team as a facilitator and examiner in 2018, supporting postgraduate students in reflecting on their learning in the course and developing their teaching philosophies. Her research interests include children's language, early literacy and health professions education. She is currently involved in a research project funded by the British Academy investigating the impact of teacher training to support early language and literacy development in pre-grade R classrooms.

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emerged as an exciting area for growth in South Africa. Plastow is a proud founding member of the SUN Telerehabilitation Initiative and leads the steering committee that developed the first telerehabilitation curriculum for undergraduate students in South Africa. In her free time, she is the wife of an entrepreneur and a mom to four children.

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Quinette Louw is the executive head of the Department of Health and Rehabilitation Sciences at SUN, South Africa, a research chair in Innovative Rehabilitation and an adjunct professor at the University of South Australia.

Her qualifications include a BSc from the University of the Western Cape, a MASP, as well as a PhD from the University of South Australia. She has published 140 research papers and supervised 85 postgraduates (Master's and PhD). Her research aims to optimise human functioning and advance rehabilitation as applicable to the African context. The specific research activities centre around the contextualisation of evidence-based management and the translation of evidence by developing innovative clinical guidance documents and tools to facilitate the translation of evidence that could improve person and system outcomes and promote health. Louw is acknowledged by the National Research Foundation as a B2-rated scientist. She regularly serves on national and international expert panels (e.g. WHO) to provide expert input related to her research field. Louw has fostered long-term, productive linkages with national and international research institutions, professional bodies and relevant government departments.

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# Preface

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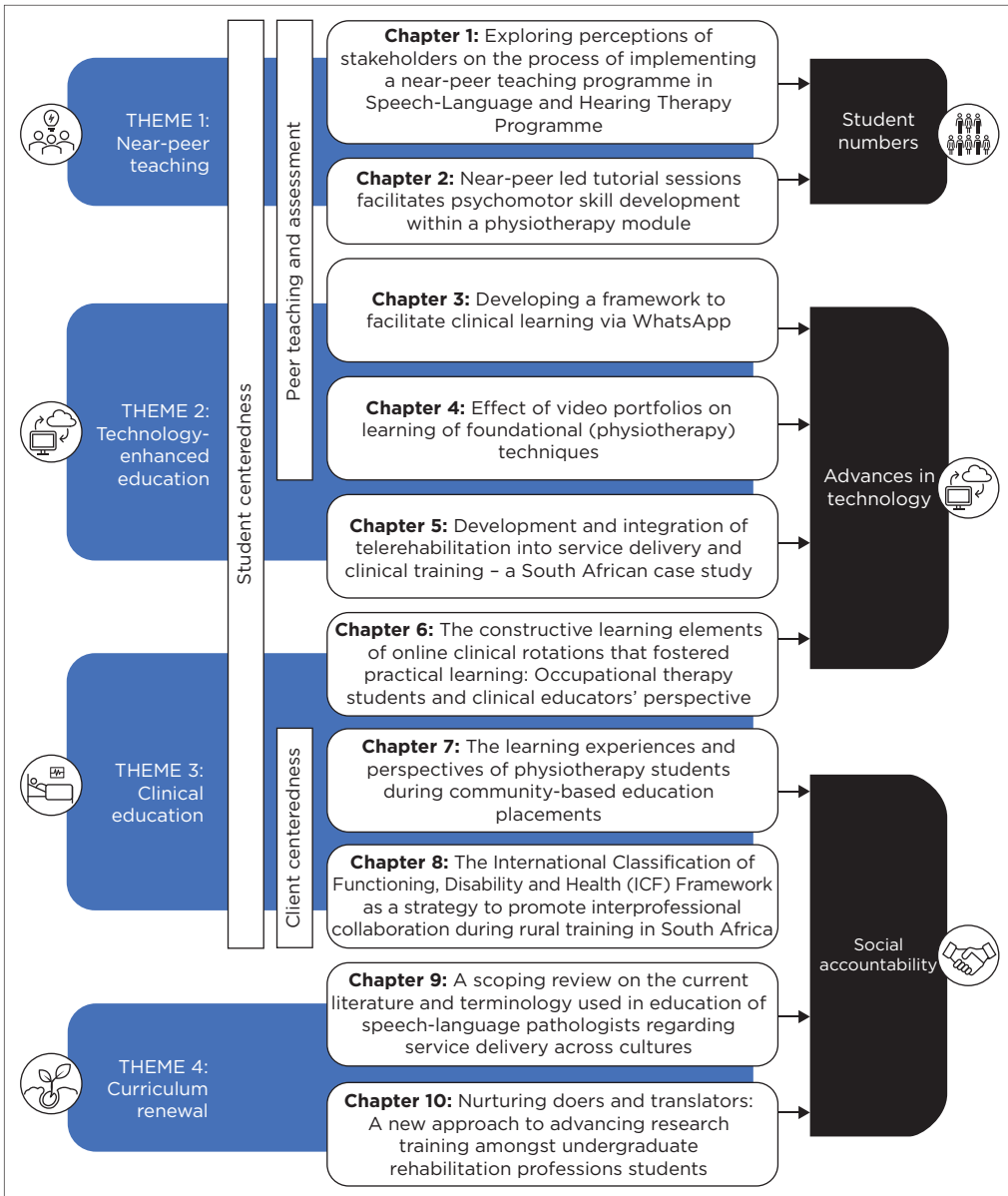
The World Health Organization (WHO) identifies rehabilitation as an important part of universal health coverage and defines rehabilitation as ‘a set of interventions designed to optimize functioning and reduce disability in individuals with health conditions in interaction with their environment’ (WHO 2022). While client-centredness is at the heart of rehabilitation, this book showcases student-centredness at the heart of the education of rehabilitation therapists. In this way, Rehabilitation Science graduates may develop into competent, resilient and reflective health care practitioners who are able to adapt to the changing and growing health care needs of the population it serves.

To achieve this notion of developing the rehabilitation science leaders of the future, higher education institutions offering rehabilitation sciences in South Africa must navigate many challenges characteristic of a low- to middle-income context (The World Bank 2022). These challenges transcend the higher education sector and the health care sector where students are placed for their clinical education. Such challenges comprise increased number of students, the rapid expansion and availability of technologies to support learning and practice, the rise in non-communicable diseases and South Africa’s burden of disease together with the increased demands for social accountability of curricula (Academy of Science of South Africa [ASSAf] 2018).

The most recent and profound challenge has been the impact of the coronavirus disease of 2019 (COVID-19) pandemic and the resultant restrictions that impacted learning and teaching. It is these challenges that initiated many of the innovative solutions, options and frameworks that are reported on in this book.

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The book is organised into four distinct, but interrelated themes. The themes were constructed based on the core concepts within each chapter. Figure P1 serves as a guide to navigate the description of these thematically organised chapters by highlighting the conceptual link between the core focus of the respective chapters through the lens of it responding to these challenges. *A student-centred approach* is another thread across many of the chapters, with seven chapters (i.e. Chapters 1, 2, 3, 4, 6, 7 and 8) including students as



**FIGURE P1:** A guide to the organisation of the chapters in the book.

study participants. This was further reinforced with *peer teaching and assessment* being the focus in Chapters 1–4, thus reflecting the fundamental role of rehabilitation sciences students within the learning and teaching context. The concept of *client-centeredness* cuts across Chapters 7 and 8.

1. The first theme focusses on the value of ‘Near-peer teaching (NPT)’. The theme appreciates the role of students as teachers not only to patients and caregivers but also to fellow students. The collaborative learning opportunities explored in Chapters 1 and 2 facilitated communication and psychomotor skills, respectively. The chapters highlight the benefits and challenges of NPT with Chapter 1 proposing a framework for the development of an NPT programme, to navigate the challenges that it presents. The peer-assisted learning employed in these chapters not only responds to the increasing number of students being admitted to health sciences programmes, with resultant higher student-to-lecturer ratios, but also affords students the opportunity to develop the important professional skills of teaching and training others.
2. The second theme, ‘Technology-enhanced education’ outlines the use of various modes of technology to support and facilitate clinical education. The concept of the collaborative teaching strategy of peer-assisted learning is also carried further in Chapters 3 and 4. Chapter 3 developed a pedagogical framework for using mobile phone technology (i.e. WhatsApp) to facilitate case-based, peer learning, while Chapter 4 explored the use of an e-portfolio of self-recordings and peer assessment of foundational skills to promote experiential learning and to develop self-regulated learning. Chapter 5 is a primary example of the collaborative research conducted by the three disciplines making up the Department of Health and Rehabilitation Sciences at Stellenbosch University (SUN). The focus on telerehabilitation reflects the use of technology as a new method for clinical teaching born out of the restrictions placed on clinical training during the COVID-19 pandemic. It outlines the collaborative interdisciplinary, development and introduction of telerehabilitation into clinical education. The chapter summarises contextual factors to consider for the implementation of contextually relevant and sustainable telerehabilitation for clinical training in an African context.
3. Although theme three is grounded in ‘Clinical education’, Chapter 6 bridges themes 2 and 3 with its focus on the online platform to facilitate clinical education, indicating a shift from traditional face-to-face learning and teaching towards the use of a hybrid approach. Chapter 6 describes the constructive elements of online clinical rotations that contributed to students learning experience and the potential it could contribute to and facilitate a hybrid learning method that will allow for optimal clinical education. Chapter 7 is the first of three chapters (i.e. Chapters 7, 9 and 10) related to the concept of social accountability. It focusses on community-based education, providing valuable opportunities for personal and

professional development by fostering students' interprofessional learning and creating awareness to influence the social determinants of health. Continuing with interprofessional learning, opportunities to promote interprofessional education during undergraduate health professions education are highlighted in Chapter 8. This is achieved by embedding the International Classification of Functioning, Disability and Health Framework into the existing curriculum and facilitating students to engage collaboratively in the clinical setting.

4. Both chapters in the final theme of 'Curriculum renewal' can be viewed as a response to the increased need for social accountability of curricula. This is done in Chapter 9 as it highlights cultural competence as a key component to be included in health care curricula. This chapter explores curriculum renewal through the recognised need for education regarding cultural competence for rehabilitation professionals. It identifies cultural competence as encompassing cultural humility, cultural responsiveness, cultural fluency and cultural safety. An important finding of this scoping review is the dire need for more research on how to educate for cultural competence in Africa, a country of rich and diverse cultures. Chapter 10 describes the interprofessional process followed in the development and design of an undergraduate research methodology module. This curriculum renewal process aimed to not only enhance the learning of core research competencies but also highlight the importance of equipping undergraduate rehabilitation students with a means to bridge the gap between research as a professional function and their clinical practice. It recognises that exposing undergraduate students to practical research competencies can enhance their understanding of local contextual needs and their roles as possible change agents for the community (Health Professions Council of South Africa [HPCSA] 2014; Knight, Van Wyk & Mahomed 2016). The chapter embodies a student-centred approach in curriculum design to focus on knowledge translation, enabling rehabilitation therapy graduates to conduct and implement research in practice.

Although the research in this book stems from one higher education institution in South Africa, the authors of each chapter have highlighted how the lessons learnt and the evidence produced may be applicable or adaptable to the broader African context. The focus is to have the findings and recommendations inform and guide the practical implementation of the findings and recommendations within the learning and teaching context of rehabilitation science students.

# **THEME 1**

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## **Near-peer teaching**





# Exploring the perceptions of stakeholders on the process of implementing a near-peer teaching sub-programme in the Speech-Language and Hearing Therapy Programme

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## ■ Abstract

**Background:** Near-peer teaching (NPT) is recognised as an effective approach to learning and has been incorporated into courses using a variety of approaches. However, the process of developing and implementing such a programme should be planned carefully.

**Aim:** The purpose of this study was to develop a framework for the development and implementation of NPT by exploring the perceptions of stakeholders on their experiences of NPT in a speech-language and hearing therapy (SLHT) programme. Second-year students received training on how to support parents and caregivers in facilitating the communication development of babies and young children. These students then had to teach this knowledge and strategies to the first-year students to prepare them for their future professional roles as early communication intervention providers in community settings.

**Methods:** A qualitative interpretive research design was employed to identify the key considerations when developing an NPT programme. Thirty-five (35) first-year students and 34 second-year students participated in eight focus group discussions after completing NPT sessions. The reflections of two coordinators involved in this initiative were analysed. Inductive thematic analysis was conducted to explore the perceptions of the participants regarding the NPT process.

**Findings:** The preparation of students for NPT and the alignment and positioning of the teaching content within the curricula were the key considerations. Managerial aspects such as communication with stakeholders and logistical arrangements were identified as critical for the programme's success.

**Conclusion:** To ensure effective NPT, specific aspects should be attended to from the developing phase. A framework to assist with the development and implementation of NPT was designed based on the findings of the study.

## ■ Introduction

The roles of educator and trainer are included in the Scope of the Profession of speech-language therapy (SLT) (*Health Professions Act 56 of 1974*). These regulations specifically mention the roles of offering 'training to caregivers, families and other professionals' and 'educating, supervising and mentoring of current and future speech-language therapists' (Health Professions Council of South Africa [HPCSA] 1974, p. 36). As teaching and training others are important responsibilities for future practice, health sciences training programmes should be more intentional in providing opportunities for peer-assisted learning (PAL) to enable students to develop the skills required for these roles.

Peer-assisted learning is described as ‘people from similar social groups, who are not professional teachers, helping each other to learn and by so doing, learning themselves’ (Topping & Ehly 1998, p. 1). Peer-assisted learning is well described in the literature and is extensively utilised in health professions education (Bulte et al. 2007; Callese et al. 2019; Goldschmid & Goldschmid 1976; Sevenhuysen et al. 2013; Tai et al. 2017; Topping 1996). Near-peer teaching (NPT) is a specific type of PAL (McKenna & Williams 2017; Nelson et al. 2013; Ten Cate & Durning 2007), ‘involving student-teachers with one or more years’ experience compared to the learner’ (Irvine, Williams & McKenna 2017, p. 42). This teaching and learning strategy is based on a constructivist theory of education in which learning is constructed, and prior knowledge is foundational to new knowledge (Mukhalalati & Taylor 2019). Furthermore, PAL draws on the notion of cognitive congruence as key to effective learning during NPT (Irvine et al. 2017; Leong, Battistella & Austin 2012; Nelson et al. 2013; Robertson et al. 2021; Taylor et al. 2013; Ten Cate & Durning 2007; McKenna & Williams 2017).

Cognitive congruence enables a shared set of assumptions and a similar frame of reference for the tutor and tutee (Leong et al. 2012; Lockspeiser et al. 2008; Taylor et al. 2013). This includes the proximity of age (Nelson et al. 2013) and experience (Robertson et al. 2021) of the teacher and learner in the case of NPT. These factors allow near-peer teachers to impart knowledge and clarify misconceptions at an appropriate level (Lockspeiser et al. 2008; Nelson et al. 2013) because they have increased cognisance of the learner’s capability (Ten Cate & Durning 2007) and can relate with the junior student’s position (Naeger et al. 2013). Furthermore, Lockspeiser et al. (2008) also alluded to the social congruence between peer teachers and learners that results in comfortable and safe learning environments. Similar social roles create comfortable and non-threatening learning interactions, enabling free-flowing conversations (Cusimano et al. 2019; Lockspeiser et al. 2008; McKenna & Williams 2017).

Likewise, students participating in NPT show increased ‘motivation through relevance and willingness to take intellectual risks’ (Callese et al. 2019, p. 3). Some authors claim that these advantages of NPT outweigh having topic experts as teachers (Burgess, McGregor & Mellis 2014; Taylor et al. 2013), and there is growing evidence that the sensible use of peer teachers does not negatively impact academic achievements and learning (Bene & Bergrus 2014; Burgess et al. 2014; Khapre et al. 2021; Tolsgaard et al. 2007; Yu et al. 2011).

Near-peer teaching also provides educational opportunities for student-teachers themselves. In addition to consolidating their own prior knowledge (McKenna & French 2011; Robertson et al. 2021), near-peer teachers reported that teaching a near-peer motivated them to study (Hall et al. 2018), increased their confidence (Evans & Cuffe 2009; McKenna & French 2011; Naeger et al. 2013; Secomb 2008; Tai et al. 2017; Ten Cate & Durning 2007) and developed their own teaching skills (Evans & Cuffe 2009; Naeger et al. 2013).

Despite these reported advantages of NPT for both near-peer teachers and learners, NPT in health sciences often occurs informally (i.e. without faculty input) (Bowyer & Shaw 2021), and few programmes offer formal opportunities to prepare students for their roles as teachers after graduation (McKenna & French 2011; Spies et al. 2021). Furthermore, NPT is often initiated as a cost-effective measure to address increasing student numbers, rather than by the educational promise behind this approach (Anyiam et al. 2018; Burgess et al. 2014; De Menezes & Premnath 2016; Mutwali & Hassan 2013; Secomb 2008; Taylor et al. 2013; Unger et al. 2014; Yu et al. 2011). Similarly, the NPT programme reported in this study was developed because of financial constraints resulting from increasing class sizes requiring additional clinical educators. Other researchers in South Africa (Lumadi 2021; Van Schalkwyk et al. 2020) and elsewhere in the world (Higgs & Edwards 2002) also reported on increasing student numbers, placing strain on already resource-constrained environments. Near-peer teaching as a teaching strategy may, therefore, become increasingly relevant and viable in resource-constrained higher education contexts. However, irrespective of where and why it is used, McKenna and Williams (2017) advocated that NPT should be carefully planned and managed. Callese et al. (2019) raised the issue that much of the published work on this topic focuses on reporting outcomes as opposed to the processes of designing and implementing interventions to accomplish these outcomes.

More than a decade ago, Ross and Cameron (2007) published a generic framework for the design and implementation of PAL initiatives that offered a structured series of questions grouped around eight themes. It was, however, not specific to NPT in rehabilitation sciences. More recently, frameworks for the implementation of PAL were proposed by Tai et al. (2017) and Cumberworth, Apperley and Francis (2020), but these frameworks were specifically tailored for a clinical medical education context. Although these frameworks provide valuable insight into the development of PAL programmes in general, no studies could be sourced that offered guidance specific to NPT where PAL is implemented across study years in rehabilitation sciences. A deeper understanding of the considerations when designing and implementing an NPT programme involving consecutive year groups of students that differ in terms of their knowledge, exposure, programme timetables and points of reference could add to the existing literature on PAL, and specifically NPT. Furthermore, few South African studies could be found where NPT was implemented in this context (Spies et al. 2021; Unger et al. 2014; Wagner & Du Toit 2020).

Our research question was therefore designed to facilitate input unique to the rehabilitation sciences and an NPT programme across study years in the South African context: what should a framework for the development and implementation of NPT in the rehabilitation sciences in South Africa look like?

## ■ Purpose of the study

The purpose of this study was to develop a framework for the development and implementation of NPT by exploring the perceptions of stakeholders on their experience of NPT in a speech-language and hearing therapy (SLHT) programme.

## ■ Objectives of the study

- To describe the perspectives and experiences of first- and second-year students who participated in the NPT programme as tutees and tutors, respectively.
- To describe the perspectives and experiences of NPT programme coordinators about the NPT programme.
- To determine key elements in developing and implementing the NPT programme from the perspectives of coordinators and students.
- To develop a framework for the design and implementation of the NPT programme.

## ■ Methods

### □ Research design

This interpretive study followed a qualitative descriptive research design using semi-structured focus group discussions (FGDs) with SLHT students who had participated in the NPT programme and written reflections from the two coordinators of the programme. This design allowed for rich descriptions of the participants' experiences during the NPT. Furthermore, to develop a framework, it was necessary to not only describe perspectives but also develop an understanding of how and why the same events are interpreted differently, even conflictingly, by different stakeholders (Sofaer 1999).

### □ Study setting

All first- and second-year SLHT students at Stellenbosch University (SUN) participated in the NPT. It was coordinated by two lecturers in the SLHT programme who were also on the research team of this study (Helena Oosthuizen and Monique Visser). The second-year SLHT students (tutors) were responsible for teaching the first-year SLHT students (tutees). Participation in the NPT was compulsory for all students as it formed part of the curriculum. As tutors were allocated in rotations for their clinical training, half of the students participated during the first semester and the other half of the students participated during the last semester.

## □ Procedures

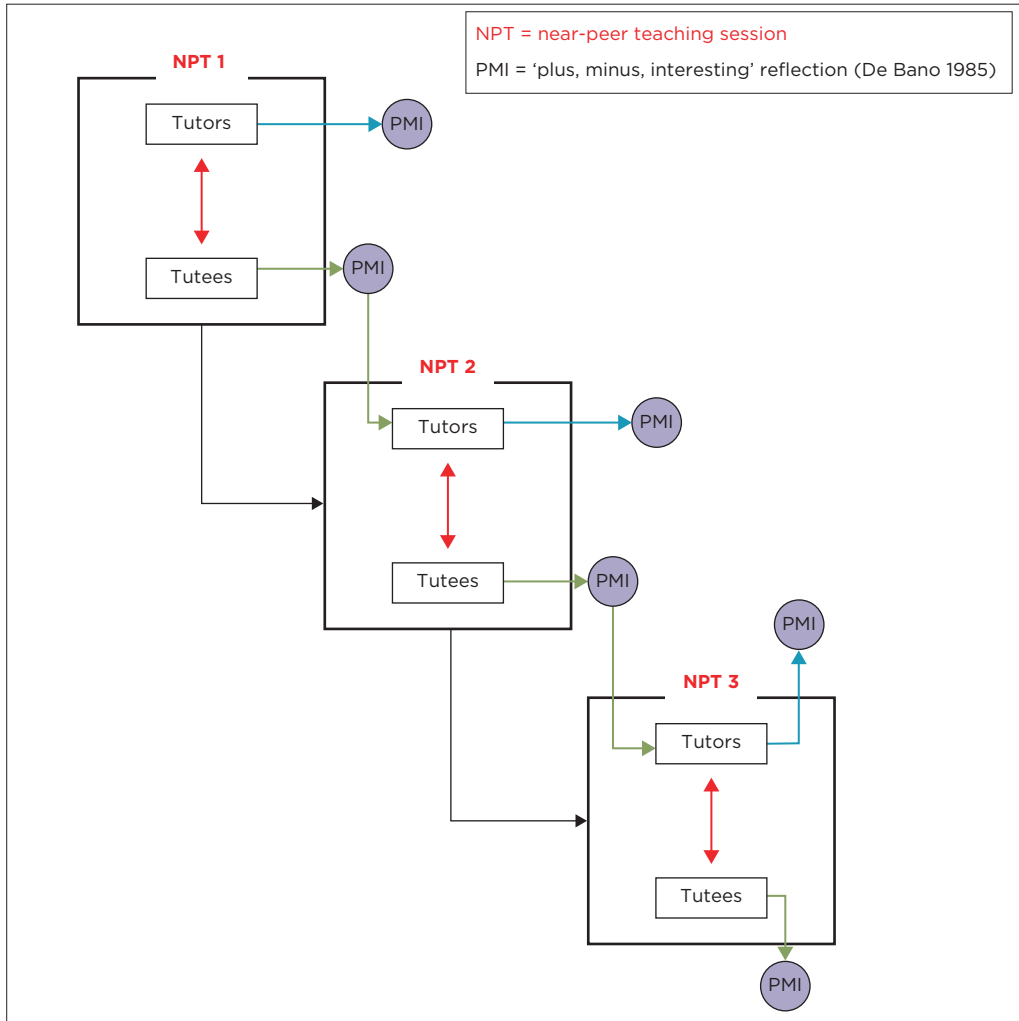
Before the start of the programme, students (i.e. both tutors and tutees) were informed about the study, the objectives and the FGDs. Research participation was voluntary. Tutors were trained in the Every Word Counts (EWC) programme, offered by Wordworks (a non-profit organisation focused on developing programmes for early language and literacy development in young children; see <http://www.wordworks.org.za/>). Every Word Counts was designed to train persons working with caregivers of young children on how to introduce new knowledge about early learning to these caregivers. Every Word Counts was selected as the content for the NPT as it is focused on early language and literacy learning and targets skills that SLTs need when working as facilitators, trainers and practitioners. The broad outcomes of the EWC and NPT programmes were to teach SLHT students to become trainers of caregivers.

The tutors were trained by Wordworks, who facilitated two 4-h-long workshops focusing on principles of caregiver training and providing ideas for the development of resources for caregivers.

## ■ Near-peer teaching programme

Following the workshops, tutors attended a preparation session facilitated by Oosthuizen and Visser, where the outcomes of the NPT programme and alignment of the SLT's scope of practice with the EWC contents, as well as the role of teachers or trainers, were presented and explained to them. The tutors were encouraged to share ideas about effective ways to present the EWC contents to their tutees. In addition, reflections on 'good and bad learning experiences' were facilitated in the group. Thereafter, tutors' feedback was summarised and provided to the group as guidelines to enhance their teaching.

The coordinators assigned students to small teaching teams consisting of two tutors and two tutees, taking into consideration the students' clinical placements. Timeslots of two hours each on three consecutive Mondays were allocated for the NPT. Rooms were booked that could be utilised, although students were encouraged to meet up at a place convenient for them. Consistent with the theory of deliberate practice (Ericsson, Krampe & Tesch-Römer 1993), the coordinators solicited brief written reflections after each session from all students by means of the PMI (Plus, Minus, Interesting) thinking tool (De Bono 1985). According to Wang and Zorek (2016, p. 2), this theory posits that 'time for self-reflection, and instantaneous feedback are vital for allowing the learner to self-adjust and make improvements before engaging in the next task'. Tutees' anonymised PMI feedback was shared weekly with the tutors as a group to encourage reflection on their teaching and own learning through the NPT. Figure 1.1 displays the NPT process that was followed.



## ■ Participants

Thirty-five (35) first-year and 34 second-year SLHT students, and the two coordinators of the NPT programme participated in the study.

## ■ Data collection

The study was approved by the Stellenbosch University Health Research Ethics Committee (N19/03/038) on 17 April 2019, prior to commencing research. Written permission was obtained from the Undergraduate



Programme Committee of Programme B in SLHT as well as the University's Division of Institutional Planning. All procedures performed were in accordance with the ethical standards of the institutional research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

Tutors and tutees were invited to participate in separate FGDs through class announcements. After written informed consent was obtained from each participant, qualitative data were gathered through eight FGDs at the end of the first and second semesters. All the tutors and tutees participated except one student who was absent because of illness. Data were generated through the interaction between students, and FGDs provided the opportunity to clarify views (Skinner 2014). We further anticipated that negative feedback would be more readily shared in a group (Green & Thorogood 2018). The FGDs addressed questions about the participants' involvement in the NPT and their experiences of the process. The FGD schedule was developed by the researchers following a guide by Krueger (2000) to ensure the progressiveness of questioning. Krueger's question categories are presented in Table 1.1 with example questions from this study.

Focus groups consisted of eight to nine students each and lasted about 50 minutes. Focus group discussions took place at a time suitable for students, within one week of the last NPT session, and were audio-recorded. The third researcher (Alwyn J.N. Louw) who was experienced in this method of data collection conducted the FGD. The workshop facilitators and NPT coordinators (Oosthuizen, Visser) were not present during the FGDs to eliminate the influence of a potential power relationship (Burgoon, Johnson & Koch 1998).

Oosthuizen and Visser provided written reflections on the process of development and implementation of the NPT. These were included to gain insight into the experience from a different perspective, aiding in the development of a framework. Driscoll's reflective model (2006) and Kolb's reflective cycle (2014) were selected by Oosthuizen and Visser, respectively,

**TABLE 1.1:** Examples of questions from the discussion schedule according to Krueger's (2000) guide.

<b>Krueger's categories of questions</b>	<b>Examples from this study</b>
Opening question	Please tell me about the NPT programme the SLHT division has.
Introductory questions	What do you think was the purpose/aim of this NPT programme?
Transition questions	Do you think that this purpose was achieved? Why? Why not?
Key questions	What were the aspects of the process that facilitated achieving this? Explain your answer.
Ending question	Anything else that you think the SLHT division can do to improve the process or make it more effective?

Source: Krueger's (2000). The tabled discussion schedule questions were developed by the authors.  
Key: SLHT, Speech-Language and Hearing Therapy; NPT, near-peer teaching.

to support critical analysis of their experiences during their involvement in the NPT programme.

## ■ Data management

Audio recordings of the FGDs were prepared for analysis by a research assistant through verbatim transcription and removal of names. All transcriptions were checked against the recordings by Louw, Oosthuizen and Visser as a quality measure and to engage with the data. Thematic analysis (Braun & Clarke 2006) was conducted to explore the perceptions of the participants. This method supported the researchers' understanding of the common experiences, thoughts and behaviours of students and coordinators during the NPT, as opposed to 'unique meanings or experiences from a single person or data item' (Kiger & Varpio 2020, p. 847). Open coding was initially performed separately by every research team member (Louw, Oosthuizen & Visser) on the same two FGD transcripts (a tutor and tutee FGD). Generated codes were compared to create a thematic map. The remaining transcripts were then openly coded independently by each researcher using the data management software AtlasTi (Version 9.1.3). The reflections were coded only by Louw, who was not directly involved in the implementation of the NPT programme and could therefore offer a different perspective. The reflections were analysed following a similar approach to what was used for the FGD transcripts.

Codes were compared in an iterative process to ensure continued consistency and update the thematic map. Previously coded transcripts were recoded with new themes when appropriate. Themes that provided insights into the essential features of developing and implementing the NPT from the students' and coordinators' perspectives were identified.

## ■ Trustworthiness and rigour

The following techniques, as proposed by Frambach, Van der Vleuten and Durning (2013), were employed to enhance the quality of the study:

To enhance the credibility of findings, member checking was conducted. Students received the written transcripts of the specific FGD they had participated in and the study findings with a brief discussion of each theme with supporting quotes. Students were invited to approach the researchers should there be any disagreements regarding the interpretation of the data. No disagreements were reported. The coordinators (Visser and Oosthuizen) had continuous access to the coding of their reflections and participated in the interpretation of the results.

Data triangulation was achieved by considering the perspectives of tutees, tutors and coordinators about the programme. Investigator triangulation was reached by confirming findings across investigators. Focus group discussions were conducted in the university's library in a conference room that was considered a neutral, familiar environment for the students. The discussion was facilitated by the researcher (Louw), who was not involved with the NPT or a lecturer of the students, to encourage participants to share freely. Transferability of findings was particularly important for meeting the final objective of this study, to develop a framework for the implementation of an NPT programme. By providing detailed information about the programme, the context of the study, the sampling strategy and selection criteria, the applicability of the findings to other contexts is supported. Confirmability of the findings refers to the extent to which results are based on the specific participants and setting instead of being influenced by the researchers' bias. This concern was addressed through frequent reflection by the researchers about their influence on the findings, member checking and discussions with peers in the health sciences about the research process and findings.

## ■ Results

Focus group discussions with 35 tutees and 34 tutors and reflections from two coordinators were analysed to identify essential information and features in developing and implementing future NPT programmes. Three major themes emerged, namely: (1) preparation for meaningful engagement with NPT, (2) alignment of key factors for effective NPT and (3) management of NPT implementation (see Table 1.2 for a summary of the themes and sub-themes). Each theme is described in more depth and illustrated using participants' own words through direct quotations from the FGDs and reflections. English translations are provided for Afrikaans quotations, and clarifications are provided in square brackets where required.

**TABLE 1.2:** Summary of themes and sub-themes.

Theme	Sub-themes
1. Preparation for meaningful engagement with NPT	1.1 Readiness to teach 1.2 Students' understanding of the purpose of NPT 1.3 Empowering students to own the process 1.4 Ability to reflect critically on learning
2. Alignment of key factors for effective NPT	2.1 Content: Readiness of both groups to engage and benefit 2.2 Timing of NPT within the course 2.3 Professional scope of practice 2.4 Clear goals for selecting NPT
3. Management of NPT implementation	3.1 Effective and continuous communication 3.2 Team support (content vs coordination) 3.3 Logistics

Key: NPT, near-peer teaching.

## ■ Theme 1: Preparation for meaningful engagement with near-peer teaching

This theme focuses on the participants' perspectives regarding students' readiness to engage meaningfully with the NPT experience.

### □ Sub-themes: Readiness to teach

Most tutors did not feel prepared to teach their peers. They expressed feeling unsure, as they did not know how to prepare for the NPT sessions or how to present the information to the tutees.

'[...] from my side, I don't think I taught them well enough. Half the time I was unsure if what I was saying, if it was even relevant.' (Tutor 5, F, student, 15 May 2019)

Tutors expressed a need for more structured guidance on expected outcomes for each session, such as 'why we're teaching the first-years, what we should take from Wordworks, what we should remember and focus on while we're in the sessions' (Tutor 7, F, student, 15 May 2019). Although some tutees were impressed by the tutors' ability to make the information practical, to keep them interested and to make them feel at ease, others identified with their peer teachers' feelings of unpreparedness for the task. One tutee commented that the tutors might have benefitted from 'some material to work with, a bit more structure, or like some more, kind of, ideas' (Tutee 32, F, student, 15 May 2019). This tutee also noted that:

'[/]t just maybe came across that they [the tutors] didn't really know like exactly what they were going to do' and that they would have benefitted from someone 'explain[ing] a little bit more exactly what the purpose is of their teaching session.' (Tutee 32, F, student, 15 May 2019)

Coordinator A also expressed concern about the fact that:

'[A]lthough prep[aration] session with the second-years addressed their facilitation, teaching and learning qualities and strategies, it seems like they [the tutors] still perceived (or adopted?) a focus on the transfer/acquisition of the theory/contents.' (Coordinator A, F, lecturer, 13 November 2019)

### □ Sub-theme: Students' understanding of the purpose of near-peer teaching

Apart from the responsibility for the tutees' learning, few tutors recognised the NPT as an opportunity to develop their own professional and clinical skills. Some perceived the NPT as extra work, adding to their already heavy academic workloads and distracting them from what they perceived as their more important academic tasks:

'We feel like we don't have time to do anything else, you know. [...] but to kind of have it forced on people who actually don't want to, who feel like, you know what, their academics are more important, that for me is a bit of a fine line.' (Tutor 20, F, student, 04 September 2019)

This finding is supported in the reflection by one of the coordinators:

'[...] some of the 2nd years perceived their responsibilities as near-peer teachers as extra work, to be done in their own time, as opposed to being part of the curriculum and an opportunity for them to grow as future SLTs. This is surprising and frustrating since the rationale and scope of practice of SLTs were addressed in the prep[aration] session.' (Coordinator A, F, lecturer, 13 November 2019)

Although not all the tutors realised the value of their experiences as near-peer teachers for themselves, many tutees recognised the learning opportunities that the NPT offered the tutors, as reflected in this participant's feedback:

'I also feel like it's a way of, um, practice for the second-years, um, because they're teaching it to us and eventually, they're going to have to teach parents so... So, they're able to get feedback from us every week to see what works or what doesn't work. So eventually when they do have to teach parents they are, um, they have done it before, and they have been exposed to it.' (Tutee 28, F, student, 04 September 2019)

The tutors expressed concerns that the tutees did not understand the purpose of the NPT sessions in the academic programme, resulting in apprehension and, in some instances, a lack of interest in and commitment to the NPT experience:

'I don't think they [*the tutees*] had the same introduction to what this entails and that is maybe why their attitude was poor to an extent because they were also unsure about why they were doing it.' (Tutor 28, F, student, 04 September 2019)

## □ Sub-theme: Empowerment of students to own the process

Tutors took ownership of their roles as near-peer teachers to varying degrees. On the one hand, some tutors engaged in reflection on the effectiveness of their teaching and the tutees' learning:

'What level is that first-year on? What do they understand or what can they take from what I am saying and actually make sense of it? Or is it just going in one ear and out the other? It's a bit intimidating as well because you feel the strong sense of responsibility too because they put that responsibility on you to portray or like pass on the knowledge that you know. Are you doing it correctly, are you using the time wisely and not wasting it?' (Tutor 29, F, student, 04 September 2019)

On the other hand, it was evident that not all tutors were equally motivated to take responsibility for the tutees' learning or felt empowered to overcome challenges on their own during the NPT process:

'[...] at some point, we forgot what we learnt as well. So we were struggling going through things. At the end we just kind of do our own thing but we don't know if our own thing was valuable to the first-years.' (Tutor 32, F, student, 04 September 2019)

Lack of ownership was further evident in the fact that many tutors failed to submit weekly PMI reflections. This perceived lack of students' engagement with the process was also commented on by one of the coordinators:

'They [*the tutors*] also complained about the distribution of the contents across the sessions. This was surprising to me, because the students had the directive to plan and present the contents in any way that they found meaningful.' (Coordinator A, F, lecturer, 13 November 2019)

### □ Sub-theme: Ability to reflect critically on learning

Coordinator A pointed out that the administrative workload of providing timely feedback to the tutors should not be underestimated. Not all tutee feedback was perceived as informative, with one tutor pointing out that it was her impression the tutees in her group only gave the feedback they thought their tutors would want to hear and that as a result she 'did not know their genuine opinion on everything' (Tutor 33, F, student, 04 September 2019). Although some tutors experienced the feedback as valuable, their engagement with it appeared to remain on a superficial level, as illustrated in the following quotation:

'Well, I read through the first-years' feedback, which they made available for us. It mentioned that they enjoyed it because it was a much more informal setting, compared to like being in a class and speaking to a lecturer. That's what they enjoyed about it, and I felt good about that.' (Tutor 1, F, student, 15 May 2019)

However, it is evident that some tutors were starting to engage with feedback on a deeper level, an experience that was not necessarily always comfortable, as is evident from the following quotation:

'I just want to point out that I think that we should be at a level where we're mature enough to take criticism and that focus should be to feel, okay, this isn't working, because this is supposed to be a learning experience and we are supposed to get the most out of it.' (Tutor 29, F, student, 04 September 2019)

The apparent inexperience with or lack of skill in reflection across year groups was also highlighted by one of the coordinators:

'The [*reflections*] were often perceived to be descriptive in nature. The feedback in both the 1st and 2nd years' [*feedback*] was often based on the contents, and not process/learning, but that is okay - this showed that they have engaged with the contents. However, their reflections (even on the contents of the NPT sessions) need to be at a critical level. Most students did not explore their feelings or experiences and did not question their impressions. Implications for learning or future plans were very rarely expressed. Apart from not being a productive exercise in terms of their learning, the feedback to the 2nd years was consequently sometimes also not very informative (since reasons were not provided or alternatives not explored).' (Coordinator A, F, lecturer, 13 November 2019)

Coordinator A felt that more need to be done before the start of NPT to prepare both groups of students in terms of doing critical self-reflection and receiving feedback.

## ■ Theme 2: Alignment of key factors for effective near-peer teaching

This theme relates to the need for alignment between several factors to have an NPT experience that is positively perceived by various stakeholders. The respective sub-themes address the diverse ways in which alignment may need to be achieved.

### □ Sub-theme: Content – readiness of both groups of students to engage and benefit

To conduct an effective NPT session, tutors need to see how the specific content they were required to convey is linked with tutees' prior learning. Students from both year groups articulated an awareness of this link in content across year groups:

'We have already learned what they [*the tutees*] learned and because they were also doing it now during this time. Their curriculum in [*term*] 1 to 2 is actually the theory of this [*the NPT content*] and we build a bit on the theory.' (Tutor 17, F, student, 15 May 2019)

One tutor pointed out the importance for tutors to know where exactly tutees are at that point of their curriculum to optimally tailor the content to fit their learning needs. Tutors could then draw on their practical experiences so far during the course:

'So I wasn't sure before seeing my first-years that while I'm teaching them, they are there at that level, or not at that level, they are at that part of the work. Because for example, some things I would explain to them, and they'd be like we haven't done that yet. That sets back your session, because you plan your session in a certain way, and each information that you give them, leads to something, and then that gap in there messes up your whole session.' (Tutor 4, F, student, 15 May 2019)

In contrast, some tutors felt that the content they had received was not enough to warrant the time set aside for the NPT sessions. It is important to note, however, that tutors who reported finding the content unsuitable for NPT also held more negative views about the NPT experience in general and the relevance of the content for the SLT's scope of practice. They may therefore have been less motivated to actively seek links between the NPT content and the knowledge of tutees:

'[...] the information from [*the NPT content*] was interesting and everything, but it's not necessarily relevant to speech therapy and what they [*the tutees*] are learning, a lot of it.' (Tutor 4, F, student, 15 May 2019)

Students from both year groups also expressed different opinions about the type of content that would be most suitable for NPT. Some felt that more challenging topics are ideal for NPT, whereas one tutor mentioned that 'we cannot teach them like the most difficult things, I feel that the lecturer can' (Tutor 14, F, student, 15 May 2019).

## □ Sub-theme: Timing of near-peer teaching in the course

The tutors' attitudes towards NPT seemed to be influenced by how relevant they perceived the content to be for themselves at that point in their studies:

'Maybe they should find an organisation where they can help us with our practicals right now and maybe doing [the content] in a later year when you will have more contact with parents. Then people will feel more positive about it because we are learning about it now, but then we're only going to use what we've learnt a few years from now.' (Tutor 2, F, student, 15 May 2019)

Aspects of the content they were teaching, which were of practical value to their current clinical training, were positively perceived. Tutors who received the Wordworks content in the first semester also pointed out 'that the people who were in the first rotation missed out a bit' (Tutor 15, F, student, 15 May 2019) because they entered clinical training without the practical knowledge gained from attending the Wordworks workshops. Tutors were less motivated to convey information to the tutees that they felt had less immediate value for themselves or that felt like repetition of content they themselves had already covered in their theoretical modules, especially if it coincided with a particularly busy time in their schedule.

In turn, most tutees appeared motivated by the practical content of the NPT sessions, the opportunity to engage with their tutors in a smaller group and the glimpse these sessions provided on their next years of study:

'So [*the NPT content*] actually helped to reinforce all the things that we learnt but made it like more real. So, like how to use all that in practical situations. How it is in reality. So it made the content real.' (Tutee 32, F, student, 04 September 2019)

However, some tutees did not find the content sufficiently stimulating because aspects of the work taught by the tutors had already been encountered in their theoretical module. The amount of effort put in by tutors in their preparation for the sessions also seemed to influence the tutees' experience of the content:

'I also think it depends on how much effort the second-year or your mentors who presented your class, put in, because if they saw it as "We have to make up time, it's only a course or a project or workshop, whatever you call it, that we just have to do now." Just doing it to do it, then it's not going to be stimulating at all.' (Tutee 15, F, student, 16 May 2019)

One tutee reflected that 'maybe [the tutors] should have been third year and second year [...] because then you have a different perspective, and one has more knowledge on it' (Tutee 5, F, student, 16 May 2019).

## □ Sub-theme: Professional scope of practice

It was evident that, across year groups, those students who clearly understood where the NPT content and outcomes fit into the scope of their chosen profession had a more positive attitude towards the experience.



They could appreciate the value of the content and the NPT outcomes if they understood how it related to their future profession, even if they were not required to apply the knowledge in their own clinical work at that point in time:

'The goal why we did it, is it falls under our scope of practice as speech therapists. So it's part of us, while we are still students, to learn from each other and to then also make other speech therapists and professional people aware of [...] yes.' (Tutor 15, F, student, 15 May 2019)

However, many tutors remained unsure about where the content fits in with their future profession, as the following quotation illustrates:

'The information from Wordworks was interesting and everything, but it's not necessarily relevant to speech therapy and what they [*tutees*] are learning, a lot of it.' (Tutor 2, F, student, 15 May 2019)

### □ Sub-theme: Clear goals for selecting near-peer teaching

This sub-theme relates to the purpose of considering or implementing NPT as a learning method. There are many potential reasons for deciding to implement NPT in a programme, some of which were reflected in the variety of opinions on NPT expressed by the respective participants. For instance, some tutors did not feel that NPT addressed a real need because, according to them, the mentor programme already sufficiently addressed the need for mentoring in the programme and had the benefit of being voluntary. This sentiment was echoed by a tutee in the quotation below:

'For me, I personally feel that if you don't want to do it in second-year, so if you don't feel it's necessary for you to be the one to give it to first-years, then you shouldn't be the one. Rather get people that are enthusiastic about and actually want to do it, so that you can make it enjoyable for everybody else instead of sitting with people that, they have to do this because they said I must.' (Tutee 25, F, student, 04 September 2019)

One of the coordinators also expressed her struggle with keeping in mind clear goals for selecting NPT:

'I was continuously tempted by the idea that we should maybe ALSO teach the 1st years, to ensure the correct information is transferred (considered also teaching the 1st years and having the 2nd years only cover certain aspects). I needed to remind myself they will receive the info in 2nd year and has the fundamental knowledge from a first-year module. This concern made me consider what our desired outcomes for the NPT were? *Maybe we were not clear on expectations for the NPT?*' (Coordinator A, F, lecturer, 13 November 2019; [*emphasis in original reflection*])

This sub-theme, therefore, appears to relate closely with the theme of preparation as students' understanding of the purpose of NPT will be improved by having clear goals for an NPT programme.

## ■ Theme 3: Management of near-peer teaching implementation

This theme relates to the process of managing the implementation of the NPT programme. In the context of this study, the coordination of the programme was managed by two lecturers.

### □ Sub-theme: Effective and continuous communication

The need for effective and continuous communication between the people who share responsibility for planning and coordinating the NPT experience became apparent from the reflections of the coordinators:

‘Close collaboration and clear communication with [*coordinator A*] was essential, since we fulfilled different roles.’ (Coordinator B, F, lecturer, 11 November 2019)

As each coordinator took responsibility for a distinct component, it was important for each to keep the other up to date on their respective complementary actions in rolling out the NPT programme. Clear communication pathways were needed between students and coordinators, for instance, to ensure that students were aware of the times and venues of upcoming NPT sessions. This was of particular importance for tutors who had to plan for NPT sessions in their already busy timetable. Coordinator B (F, lecturer, 11 November 2019) highlighted a need for coordinators to compile a detailed timeline during the planning phase of the project and for roles to be clearly outlined to ‘limit any confusion or oversights.’

### □ Sub-theme: Team support (content vs coordination)

The coordinators appreciated knowing that they functioned as part of a team who shared responsibility for distinct aspects of the programme. These were content, on the one hand, and practical considerations involved in the facilitation of the contact between year groups, on the other hand. Both coordinators were involved in the curriculum of the tutees and therefore were familiar with the students’ knowledge base, which was perceived as a benefit by both coordinators:

‘I was mainly involved in helping with the logistics of the contact sessions between the division and the students, and between the students. This was a shared responsibility between myself and the primary researcher. [...] I did not need to have this content knowledge in order to facilitate practical arrangements, and it was helpful to know that someone else could manage that aspect of the NPT.’ (Coordinator B, F, lecturer, 11 November 2019)

Both coordinators highlighted the considerable administration involved in implementing an NPT programme and that this needs to be considered during the planning process.

## □ Sub-theme: Logistics

This sub-theme relates to the administrative aspects of time, venue and group size that emerged as important factors to consider in the process of designing and implementing an NPT. Small group size (i.e. two or three tutors paired with two or three tutees) was perceived as a distinct benefit by both year groups. Tutors found it valuable to work with another student in planning and implementing the session, as they could 'see from two different perspectives, it's not just your perspective' (Tutor 13, F, student, 15 May 2019). It also created an opportunity to improve their own interpersonal skills through learning to collaborate with a fellow student they may not have worked that closely with before:

'The thing with the groups is, it's a very good thing to work two-two together and also with someone that you did not choose yourself.' (Tutor 12, F, student, 15 May 2019)

The tutees felt that, if they were in the tutors' position, they would also prefer working with a fellow student rather than individually. However, they pointed out that not all the tutors collaborated equally well with one another in the planning of, and presentation of, the information, as illustrated in this quotation:

'[...] the one [*tutor*] would bring up a topic and she would explain everything, but the other one would just read off a slide or whatever, and then the other one takes over again.' (Tutee 6, F, student, 16 May 2019)

On the receiving end, some tutees initially found the smaller group intimidating as they did not know what to expect. However, they reported finding it easier to approach the tutors with questions than a lecturer, as the tutors represented someone that tutees 'felt comfortable' with (Tutee 5, F, student, 16 May 2019).

The venues that were arranged for the NPT sessions were generally perceived as unsatisfactory by the students in general, and the tutors in particular:

'It was very awkward in the beginning, because it was a very small room and there were three second-years and three first-years.' (Tutor 8, F, student, 15 May 2019)

One tutee suggested that the NPT programme could be improved by providing 'a specific place, on campus, where the internet works' (Tutee 15, F, student, 16 May 2019). Lastly, some tutors were unhappy with the timeslot during which the NPT sessions were scheduled to take place, as it overlapped with some of the previously scheduled activities on their timetables: 'I feel [...] they took our class time for this' (Tutor 5, F, student, 15 May 2019).

## ■ Discussion

This study makes a unique contribution to the existing research on PAL in general, and NPT in particular, by identifying potential barriers to the implementation of a successful NPT programme in a South African context.

Our findings add to the growing body of literature on NPT in South Africa by highlighting factors to consider in designing and implementing NPT in health and rehabilitation sciences and speech therapy in particular, where research on teaching and learning initiatives is still emerging. To develop a framework for the development and implementation of an NPT programme, perceptions and further insights from both tutors and tutees, as well as coordinators, were collated and analysed. Three main themes along with several sub-themes were identified, namely, preparation for meaningful engagement with NPT, alignment of key factors for NPT and management of NPT implementation.

There was consensus between the various stakeholders that most tutors did not seem prepared for their teaching role. The preparation session that tutors received on effective facilitation, teaching, and learning qualities and strategies appeared to have been insufficient to prepare students to engage with the NPT experience. Most tutors remained focused on the transfer and acquisition of knowledge in their interaction with the tutees and expressed a need for more structured guidance on how to present the content. Tutees showed a better understanding of the purpose of the NPT programme than the tutors, who generally perceived the NPT as extra work of less importance than other academic modules. This aligns with Tai et al.'s (2017, p. 167) finding that students may assign peer learning (as a learning method or skill) less priority under 'things to learn about' than facts or skills that can be examined. Tutors took ownership of their roles as near-peer teachers to varying degrees. A stronger sense of ownership in both year groups could be facilitated by improving students' understanding of the benefits of NPT and their ability to reflect critically on the process and their learning. As pointed out by Ross and Cameron (2007, p. 534), taking responsibility requires a 'thorough prior understanding of the practical arrangements, learning objectives, format, sequence of activities [...] for the PAL interaction', something which may have been insufficiently addressed in the NPT programme reported on here.

Our findings on the need for comprehensive efforts to prepare students to be near-peer teachers are in line with those of previous researchers (Khapre et al. 2021; Nestel & Kidd 2003; Tai et al. 2017). Students who volunteer for peer-teaching initiatives are more likely to present with effective teaching skills than those who choose not to volunteer. Preparation may therefore be of even greater importance if participation in NPT is made compulsory for all senior students, many of whom do not necessarily perform well enough academically to be confident in their ability to teach others (Spies et al. 2021). Furthermore, our findings highlight the value of creating opportunities for consistent feedback and the related need to empower students in both year groups to engage effectively with feedback to enable reflective practice. This feature of effective NPT programmes has not received adequate attention in the literature.

As NPT entails learning across year groups, it adds an additional alignment dimension for the development of the programme. Careful consideration is

warranted in deciding where in the respective groups' programme the NPT experience should occur (Ross & Cameron 2007). Tutors in our study might not have seen the value of the NPT content because of their own limited clinical experience. To address this challenge, near-peers could arguably also be students more than one year removed from their tutees (e.g. third years) if students are aligned closely enough in terms of content to achieve cognitive congruence. Tutees themselves need to have at least some knowledge or experience within the programme to benefit optimally from the input provided by the tutors. As the content presented to the tutees in this study was not completely new, it was of particular importance for tutors to have a good understanding of the tutees' prior knowledge and experience at the time when they participated in the NPT programme. Once NPT programmes are consistently implemented, tutors would also be able to draw on their own experience of having been a tutee.

This alignment is also required in terms of the year groups' respective schedules, especially relating to the availability of the tutors who need to dedicate more time to prepare for the NPT session than the tutees who may only be required to attend. Many tutors noted that the timing of the NPT sessions was not ideal as it coincided with a particularly busy time in their schedule. As the tutors rotated through the NPT sessions because of their involvement in the clinical practicum at contrasting times of the year, the timing of NPT emerged as a crucial factor in the way tutors viewed the experience. Tutors who received the content in semester one - before starting clinical training - felt that they had had an advantage over tutors who received the content in semester two and who had effectively missed information that would have been of practical value to them at the practicum. Alignment is also required in terms of the NPT content and outcomes with the professional scope of practice. Those students who clearly understood where the NPT content and outcomes fit into an SLT's scope of practice had a more positive attitude towards the experience. Although one of the presenters of the Wordworks workshops was an SLT, all other presenters were from outside the division, which could partly explain why students may have had difficulties in making a link between the specific content and their professional scope of practice. Although tutors had received an orientation session to help them prepare for their NPT sessions, it had taken place after they had received training on the content. This highlights the importance of explicitly drawing the link between the NPT content and the professional scope of practice for tutors before they receive the content.

Ross and Cameron (2007) emphasised the need for relevant stakeholders to have a clear understanding of their goals for selecting PAL. The same need was identified in our findings with reference to NPT as a specific type of peer learning. This includes considering the specific need NPT addresses and where in the programme it could best be located to address that need. There also

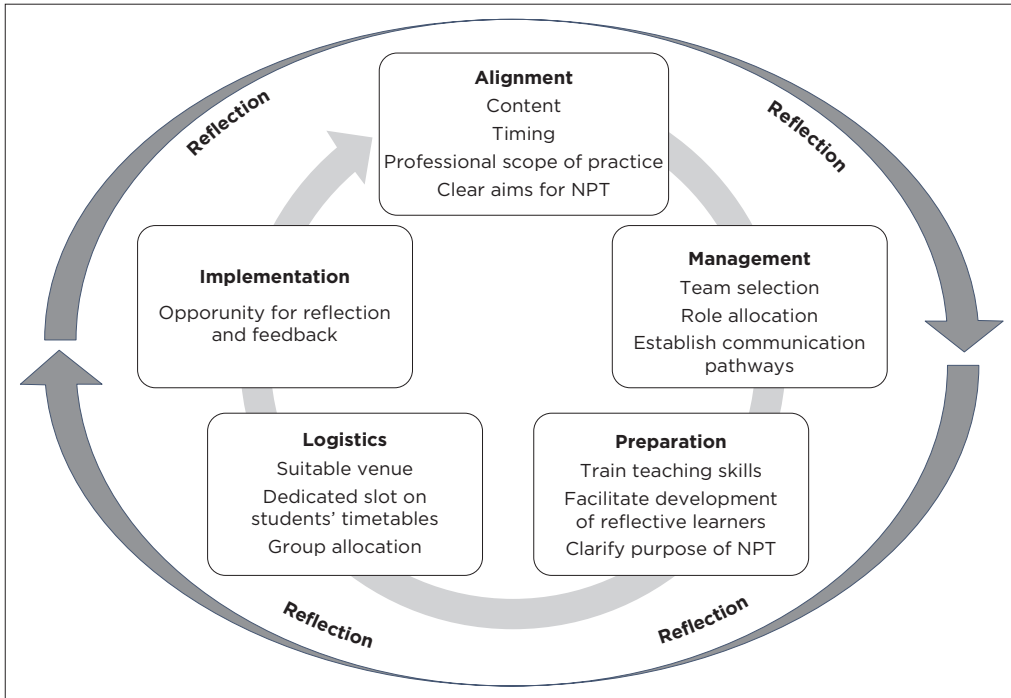
needs to be clarity regarding how NPT may differ from, but also complement, existing initiatives in the programme and how it aligns with the professional scope of practice. The latter is of particular importance in programmes such as ours where students pursue a professional qualification. These goals will then enable decision-makers to plan a tailor-made NPT programme that serves the unique needs of the programme. This information also needs to be communicated clearly to students.

Key aspects related to the management of the NPT programme were identified as a central theme. Management of any PAL initiative requires a team approach (Ross & Cameron 2007). Coordinators in our study reflected on the benefits and potential pitfalls of having complementary and, at times, overlapping roles. Although one coordinator took greater responsibility for content and the other for coordination, having both coordinators involved in some aspect of the curriculum for both year groups was considered a strength. It became apparent that there were considerable logistical requirements for ensuring that the NPT learning experience runs smoothly, a finding echoed in many other studies (Nestel & Kidd 2003; Ross & Cameron 2007). Shared responsibility for the implementation of the NPT programme necessitated effective and continuous communication not only between the coordinators but also with students. Logistical factors that were identified related to group size, time and venue. Assigning tutors in pairs appeared effective for use in NPT and is in line with recommendations by other authors (Nestel & Kidd 2003). Having small groups of tutees and tutors may have facilitated social congruence between participants (Lockspeiser et al. 2008) and in so doing contributed to creating a safe learning environment (Tai et al. 2017).

Decisions about when NPT sessions take place depend on the context and aim of NPT in the programme (Ross & Cameron 2007). In this study, venues were organised by the coordinators, but students were encouraged to make use of other suitable spaces. Tutors, however, seemed reliant on provided venues, which might be explained by the lack of ownership and motivation generally observed among tutors. In future iterations of the programme, coordinators might consider letting students manage this aspect themselves (e.g. using public spaces on campus with wireless internet access) as one way of empowering them to take ownership of the process. Lastly, the timetables that students receive at the beginning of the academic year need to reflect a dedicated timeslot for NPT to ensure that students see it as a central part of their curriculum.

We propose that the key elements contained in the themes identified in our study can be conceptualised and operationalised in the form of a framework (Figure 1.2).

In this framework, considerations relating to alignment form the first step in the process of planning an NPT programme. Cross-year teaching necessitates



Key: NPT, near-peer teaching.

**FIGURE 1.2:** Proposed framework for the development and implementation of an NPT programme.

close alignment in content across the curricula of the respective year groups. In addition, the aims of the NPT need to be clear to all stakeholders and be aligned with the professional scope of practice. Once stakeholders have a clear idea of outcomes and timing, team members need to be selected to plan and implement the NPT programme. Obeng (2003, cited in Ross & Cameron 2007, p. 537) distinguished between 'people to involve, people to consult and people to inform (in advance).' At this stage, the focus is on 'people to include' to manage both content and coordination of the process, with clear role allocation and communication pathways delineated. The respective student cohorts (tutors vs tutees) are key members of the team, and each cohort is included in the programme for different educational purposes. Tutors' perspectives should also be obtained during the management phase, given the active involvement that their participation in the programme would require. Depending on the aims of incorporating NPT in the curriculum, all students in a cohort could be considered, as tutors or students could participate on a voluntary basis. The next step is the preparation of all students for the NPT experience before implementation, for instance, through training in teaching methods and philosophy, effective ways to conduct self-reflection and engage with feedback, and informing students about the purpose of NPT for their studies. Thereafter, coordinators need to identify logistical factors,



including potential barriers to implementation, for example, decisions around NPT group allocation, venues and locating a suitable time on students' schedules, before proceeding to implementation. In the proposed framework, self-reflection forms a central part of developing the skill to teach others. Deliberate practice principles are incorporated by the inclusion of a 'self-reflective feedback loop' (Wang & Zorek 2016, p. 2), which highlights the need to create frequent opportunities for students to critically reflect on their own learning and to engage productively with feedback from those they teach. Our framework, therefore, differs from that of Cumberworth et al. (2020), who recommended collecting feedback only after the programme. Our framework is intended to complement those of Ross and Cameron (2007), Tai et al. (2017) and Cumberworth et al. (2020) by highlighting key considerations for the development and implementation of NPT, specifically in a rehabilitation sciences context.

## ■ Limitations and recommendations

Focus group discussions were conducted with students from an SLHT undergraduate programme following a specific NPT programme at one South African university. Findings may not be generalisable to other settings and contexts. However, there may be similarities that would offer insights for other programmes in the health and rehabilitation sciences. Recommendations for practice are presented in Box 1.1.

The study did not objectively measure or evaluate the outcomes of the NPT programme but instead focused on obtaining all stakeholders' perceptions of the process to offer considerations for the design and implementation of future NPT endeavours. The first two authors (Visser, Oosthuizen) were involved as researchers and participants in this study and therefore sought to reflect different perspectives through the involvement of the third researcher (Louw), who was not involved with the SLHT programme nor the development and implementation of the NPT. We further mitigated the potential bias through frequent reflection about our influence on the findings and through member checking.

### **BOX 1.1:** Recommendations for practice.

1. Frequent opportunities for self-reflection will allow students to make continual improvements to their NPT practice (deliberate practice).
2. Logistical factors require careful consideration before proceeding with the implementation of NPT.
3. When NPT occurs across year groups, curriculum content must be closely aligned.
4. Decisions around tutor selection should be guided by the aim of including NPT in a programme.
5. Aims of NPT need to be clearly communicated to all stakeholders and aligned with the professional scope of practice.

Key: NPT, near-peer teaching.



## ■ Conclusion

Our study highlighted essential factors to be considered in the process of development and implementation of future NPT programmes. There is a need to empower students across year groups to critically reflect on NPT learning experiences, both before and during participation in the programme. Future research is needed on how programmes can offer opportunities for senior students to grow in their teaching role while still ensuring that the quality of teaching and ensuing educational benefits to junior students be maintained.

# Near-peer tutorials facilitate psychomotor skills development in physiotherapy

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## ■ Abstract

**Background:** Higher students-to-lecturer ratios reduce opportunities for individual feedback affecting the development of psychomotor skills in physiotherapy. To supplement their classroom presence and to maintain the quality of the academic programme, the Division of Physiotherapy at Stellenbosch University implemented near-peer-assisted tutorials, where senior students (tutors) deliberately help and support junior students (tutees) in developing psychomotor skills.

**Aim:** The aim of this study was to describe tutees' perceptions of the near-peer-assisted tutorials and determine the effect thereof on student psychomotor skills performance. In addition, lecturers' perceptions of the effectiveness and sustainability of this strategy were sought.

**Methods:** A before-after experimental design incorporating an explanatory sequential mixed methods approach was used to explore the tutee and lecturer perspectives of these near-peer-assisted tutorials. On completion of the module, tutees completed a self-perception questionnaire, and lecturers participated in two focus group discussions. Effect on performance was monitored by comparing pre-post scores of objective structured practical examination (OSPE) scores using the chi-squared test.

**Findings:** In total, 56 (93%) second-year tutees completed the questionnaire. Most (86%  $n = 48$ ) agreed that the near-peer-assisted tutorials had added value and helped them prepare for the OSPE, and 73% ( $n = 41$ ) agreed that it was essential for their academic success. Tutees performed better in the OSPEs post-intervention ( $p < 0.001$ ), and more students successfully completed the final OSPE ( $p = 0.01$ ). Lecturers perceived the tutorials as time-saving for themselves and for students and reported observing reduced anxiety among students and improved performance during assessments. Lecturers highlighted logistical challenges and made suggestions for sustainability.

**Conclusion:** A near-peer-assisted tutorial that enables individual and timeous feedback can be a successful strategy to assist students in large classes to prepare better for the OSPE. However, whether improvement in the performance of psychomotor skills is also observed in the clinical setting is yet to be explored.

## ■ Introduction

Changes in South African higher education are placing existing resources under pressure to maintain the quality of education and training in health professions programmes. Two factors within the South African health sciences context resulting in a resource-constrained environment relate to the increasing number of students admitted to academic programmes as well as

the readiness of the students for higher education (Volmink 2018). Globally, the increase in non-communicable diseases, as well as the increased number of survivors of infectious diseases such as human immunodeficiency virus and tuberculosis, is placing an additional burden on the country's health care systems (Mayosi et al. 2009; Morris et al. 2021). This has led to an increase in the number of health professional graduates to address the changing and growing health care needs of the population. In addition, within the South African context, there is a growing need to expand access to higher education to facilitate the much-needed societal transformation (Van Heerden 2013). However, the increased admissions to health science programmes have increased the burden on lecturers, which has implications for the quality of training of health care professionals. Students in physiotherapy must reach minimum competency in numerous complex clinical psychomotor skills. While there is no evidence informing optimal student-to-lecturer ratio in higher education, ratios of 5:1 up to 20:1 to enable on-demand and individual feedback are recommended (Archer, Van Hoving & De Villiers 2015; George & Doto 2001; Professional Board for Physiotherapy, Podiatry and Biokinetics 2018). Currently, the physiotherapy programme at Stellenbosch University (SUN) lacks the capacity to deliver on these recommended ratios.

Peer-assisted learning (PAL) is well described in the literature as an effective collaborative teaching strategy to promote the development of knowledge and skills through deliberate helping and supporting among equals or matched cohorts (Brierley, Ellis & Reid 2022), and can be facilitated through the horizontal (same class group) or vertical (senior students interacting with junior students) structuring of a course (Bugaj et al. 2019). Peer interaction is also reported to assist students with gaining confidence when engaging in learning material with one another (Bugaj et al. 2019; Yu et al. 2011). Lockspeiser et al. (2008) in their early study exploring perceptions of students being taught by peers instead of lecturers reported on the value of social and cognitive congruence in learning. According to their study, a teacher with a similar knowledge base to the learner is more effective than one who is an expert in the field but with a disparate knowledge base (Lockspeiser et al. 2008). Similarly, a student who is one or more years senior in training to more junior students may better understand the challenges students face and could therefore explain concepts in a more appropriate manner and be able to offer an alternative method for studying (Bulte et al. 2007; Ten Cate, Van de Vorst & Van den Broek 2012; Yu et al. 2011).

Peer-assisted learning has been successfully implemented for reasons other than the benefits to student learning, including to help lighten teaching workloads (Blank et al. 2013; Bulte et al. 2007). While some studies reported students did significantly better when a near-peer course was added to their routine coursework (Blank et al. 2013), others have reported that replacing faculty teachers with students in the clinical setting did at least not compromise the learning of the students (Burgess & McGregor 2018). Similarly, PAL of

technical skills in a skills laboratory has been shown to be as effective as training provided by experienced lecturers (Tolsgaard et al. 2007). However, despite the documented benefits, some concerns have also been raised after implementing PAL in the clinical environment. In two separate studies, junior medical students expressed the need to interact with experts in the field and reported that the interaction with senior students was often not as helpful to their learning when compared with lecturer interaction (Secomb 2008; Tai et al. 2016).

Currently, there is no 'gold standard' for many of the evaluation and treatment techniques physiotherapists use in practice. Few techniques are standardised and variations have often been reported. In our physiotherapy programme at SUN, all the foundational patient assessment and treatment techniques are taught by lecturers within the first two study years, using the five-step model for clinical skills training as described by George and Doto (2001). The first three steps in this process are completed in classroom-based lecture-practicum sessions. The indications and precautions of the techniques are described, after which the execution of the techniques is explained and demonstrated by the lecturer. The final two steps in this process include an opportunity for students to first describe the technique and then perform the technique. Immediate feedback from the lecturer is important at this stage of the process. It is argued that if feedback is not provided, students run the risk of repeating an inappropriate or ineffective execution of the technique when they practise (George & Doto 2001).

Because of the increase in student numbers, it was no longer possible for lecturers at SUN to provide individual feedback on technique performance to each student. It was not known how the utilisation of a PAL system to facilitate the learning of psychomotor skills in physiotherapy would affect students' learning nor how it would impact the quality of the academic programme at SUN. After an extensive review of the literature and consultation with colleagues and students, a near-peer-assisted learning (NPAL) strategy was developed utilising a tutorial system whereby trained third-year students (tutors) facilitated the practising of specific techniques with the second-year students (tutees).

## ■ Intervention

Ten tutors were selected from the third-year cohort through strict criteria. In addition to academic performance, students were requested to provide a motivation letter reflecting evidence of tutoring experience and of their involvement in leadership roles. All selected tutors received generic training related to tutoring and facilitation of learning by the Centre for Teaching and Learning at SUN and were oriented to the learning outcomes before the NPAL tutorial sessions were implemented. In addition, specific psychomotor skills training sessions were provided throughout by relevant lecturers. Tutors paired up, and each of the five pairs was allocated twelve second-year students (tutees).

Attendance of all psychomotor skills training sessions throughout the year was compulsory. During the first phase of the project (usual practice), lecturers were responsible for facilitating the three-hour practice sessions with all second-year students ( $N = 60$ ). During the second phase of the project (implementation), lecturers met with the tutors prior to the practice session – henceforth referred to as tutorials – to answer any questions and provide specific training concerning the techniques scheduled to be practised by the junior students (tutees). In addition, tutors received rubrics for each technique. Rubrics provided a stepwise approach to each technique and followed the format examiners would use during end-of-term assessments of these psychomotor skills. Each tutorial followed the same structure. Tutees worked in groups of three, rotating through three roles: (1) being a model, (2) executing the technique and (3) assessing using the rubric. Attendance of both lecturer-led (Phase 1) and student-led (Phase 2) practice sessions was compulsory. Lecturers and tutors kept attendance registers for each of their respective sessions.

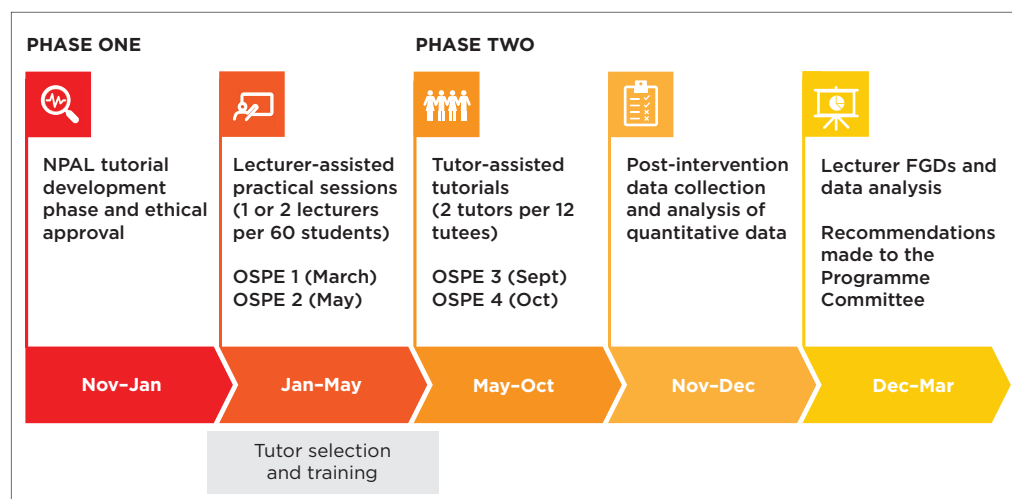
To monitor and evaluate the impact of these NPAL tutorials, students' and lecturers' perceptions of the effectiveness of this strategy on students' acquisition of psychomotor skills were investigated. We have previously reported on the benefits of this programme for senior student (tutor) learning (Unger et al. 2014). The purpose of this chapter is to report on the effects of the programme on junior students (tutees) and lecturer perspectives of the new NPAL strategy.

The specific *aims* of the research reported in this chapter were to describe the perceptions of tutees and lecturers on the effectiveness of the NPAL tutorial strategy and to report on the effect of these tutorials on the students' (tutees') performance.

## ■ Methods

### ■ Study design

A before-after quasi-experimental design, incorporating an explanatory sequential mixed methods approach, was used (Fetters, Curry & Creswell 2013). Quantitative data, generated from objective structured practical examinations (OSPEs) and self-perception questionnaire scores, were collected and analysed, followed by qualitative data collection through focus group discussions (FGDs) and analysis to provide insight and deeper understanding of students' and lecturers' experiences of this novel strategy. Correlation between OSPE scores and self-perception was not investigated. This study was approved by the SUN's Health Research Ethics Committee (N12/04/018) and by the Undergraduate Programme Committee of the Physiotherapy Division. All participants (tutees and lecturers) provided written informed consent and could withdraw at any time without prejudice.



Key: NPAL, near-peer-assisted learning; OSPE, objective structured practical examination; FGD, focus group discussion.

**FIGURE 2.1:** Near-peer-assisted learning tutorial implementation strategy and data collection timeline.

All participants were also informed that all their responses would be anonymised and treated confidentially.

During phase one of the project, existing lecturer-assisted practice sessions continued until April (Figure 2.1). During this phase, students completed two psychomotor skills assessments using the OSPE format, also known in our environment as FUSPE (*Fisioterapie Universiteit Stellenbosch Praktiese Eksamen*). The NPAL tutorials were initiated in May (Phase 2) and continued until September of the same year. Students again completed two OSPE assessments, with the final assessment scheduled for November. No practice sessions were scheduled in October or November. All data were collected after the completion of the tutorials.

## ■ Sampling

All second-year physiotherapy students ( $n = 60$ ) who took part in the NPAL tutorials (i.e. tutees) were eligible to participate in this study. Shortly after their final OSPE, all tutees were invited to complete a purposively developed self-perception questionnaire. After analysing the quantitative data, (i.e. the pre-post OSPE scores and responses to the rated self-perception questions), all lecturers involved in teaching physiotherapy psychomotor skills ( $n = 9$ ) were then invited to participate in FGDs (Figure 2.1).

## ■ Student performance

The scores for all OSPE assessments were calculated by the coordinator. Assessors of the OSPE stations were blind to the level of participation during

the NPAL tutorials, as well as to the level of students' attendance at these tutorials. The average score of the two OSPEs before implementation was compared with the average of the two OSPEs after the implementation of the new tutorial system.

## ■ Tutees' perceptions

A paper-based questionnaire was developed by the research team in collaboration with the SUN Centre for Teaching and Learning. A five-point Likert scale ranging from 'strongly disagree' to 'strongly agree' to rate various aspects of the newly implemented tutorial system was used. Nine of the 28 statements included in the questionnaire required students to rate their perceptions related to the organisation of the tutorials, six questions related to tutor competence and thirteen questions pertained to tutees' perceptions of the impact of the tutorials on their own learning and psychomotor skills development. The questionnaire was piloted among third-year students (excluding those that were selected as tutors) for comprehension and face validity. No changes were necessary. Consenting tutees completed the questionnaire at the end of the year, a few days after the final assessment of the module (Figure 2.1). The questionnaire was administered by a staff member who was not involved in the teaching of physiotherapy techniques or part of the research team.

## ■ Lecturer perceptions

The nine lecturers involved in the teaching and assessment of second-year students were invited to attend FGDs after the quantitative data were analysed. Five lecturers ( $n = 5$ ) consented to participate and attended one of two FGDs to explore their perceptions on the effectiveness of the NPAL tutorial system, as well as the implementation and sustainability thereof. One lecturer was unavailable at the time of data collection, and three lecturers did not respond to the invitation to participate, despite several reminders. These interviews were conducted during a busy period after final examinations and may account for the poor response rate.

To reduce interviewer bias and to contribute to the confirmability of the data (Connelly 2016), one of the researchers who was not involved in the teaching of psychomotor skills facilitated these discussions using a semi-structured interview guide. The interview guide included questions regarding lecturers' experience of the NPAL tutorial strategy, both positive and negative. Both FGDs were recorded, and recordings were transcribed verbatim. Although participants were asked to use pseudonyms during the discussions to help protect their anonymity, real names were sometimes used and, as such, names were replaced with participant codes, for example, P1 and P2.



Lecturers were afforded an opportunity to check the group transcripts for correctness, and similarly, the interviewer cross-checked the notes taken during the FGDs with the transcribed data, further ensuring the credibility of the data (Connelly 2016).

## ■ Data management and analysis

All quantitative data were captured onto Microsoft Excel® for processing and analysed using Statistica® v9 in consultation with a statistician. Central tendencies and data variability were reported as means and standard deviations (SDs) if data were distributed normally and as medians and interquartile ranges when not. A paired sample *t*-test was used to compare the means (SD) of tutees' performance on the OSPEs (two before the intervention and two after the intervention). A chi-squared test was used to compare the proportion of students who passed before versus after the intervention. To simplify the interpretation of the findings of the tutee questionnaire, the 'agree' and 'strongly agree' categories were grouped into an 'AGREE' category. The 'disagree' and 'strongly disagree' categories were grouped into a 'DISAGREE' category.

Qualitative data obtained from FGDs with lecturers were analysed using an inductive thematic analysis approach (Chapman, Hadfield & Chapman 2015). Two researchers, one of whom was the interviewer, independently immersed themselves in the raw data (transcripts). Using standard procedures for inductive analysis as described by Chapman et al. (2015), the researchers then independently identified codes or short phrases, then regrouped or organised these into themes. These codes and phrases were combined and compared before selecting the final (consolidated) emerging themes. To further add to the credibility of the data (Connelly 2016), where consensus could not be reached, the rest of the research team was consulted. Lecturers who did not participate in the FGDs reported similar perspectives supporting these results, adding to the trustworthiness of this analysis (Connelly 2016). Transferability of these results is limited to the SUN's physiotherapy context but sharing this experience may assist other physiotherapy programmes to enhance student learning experiences where resources are constrained.

## ■ Results

In this section, we first report on the results of the students' performance (OSPE scores) before and after participating in the NPAL tutorials, followed by a summary of tutees' perceptions of the impact of the strategy on their learning. Lastly, the lecturers' perspectives involved in this strategy are reported.

## ■ Effect on performance

Students performed better in the OSPEs after the implementation of NPAL tutorials (Table 2.1). A greater proportion of students successfully met the minimum standard in the last two OSPEs (i.e. after participating in the NPAL tutorials) compared to the scores achieved in the first two OSPEs following lecturer-led practical skills training sessions ( $p = 0.01$ ).

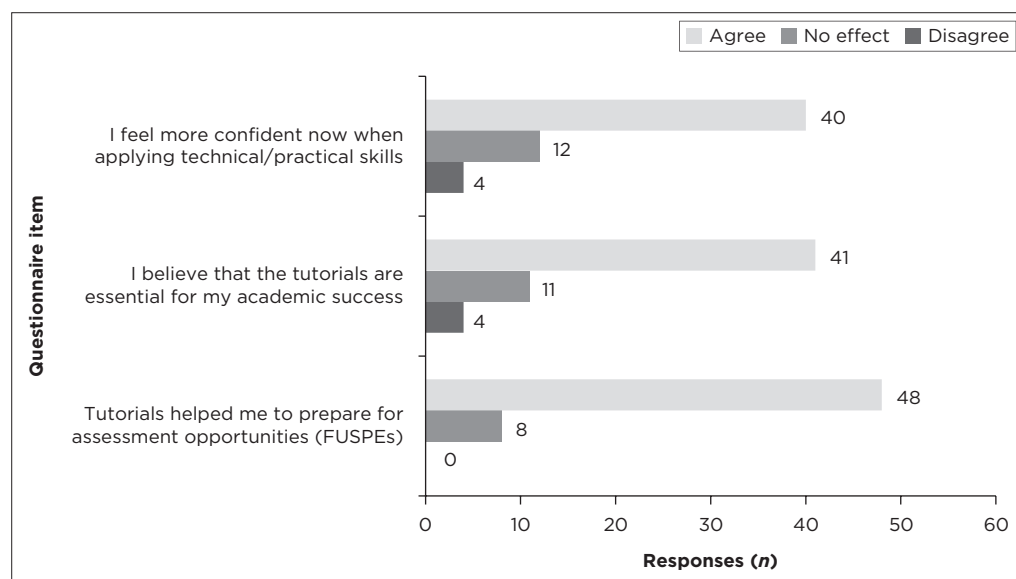
## ■ Tutees' perceptions of their learning

Ninety-three percent ( $n = 56$ ) of tutees completed the post-intervention questionnaire. Most respondents agreed that the NPAL tutorials had added value to their learning (Figure 2.2). There was consensus in the tutees' perceptions that the tutorials facilitated their OSPE preparation (86%,  $n = 48$ ). No student disagreed with this statement. In addition, many tutees agreed that the tutorials were essential to their academic success (73%,  $n = 41$ ) and that their participation in the tutorials promoted their confidence in performing psychomotor skills (71%,  $n = 40$ ).

**TABLE 2.1:** Effect of near-peer-assisted learning tutorials on objective structured practical examination scores.

OSPE scores	Mean $\pm$ SD	$p$
Pre-implementation (%)	71.58 $\pm$ 11.48	0.001
Post-implementation (%)	76.04 $\pm$ 09.40	

Key: OSPE, objective structured practical examination.

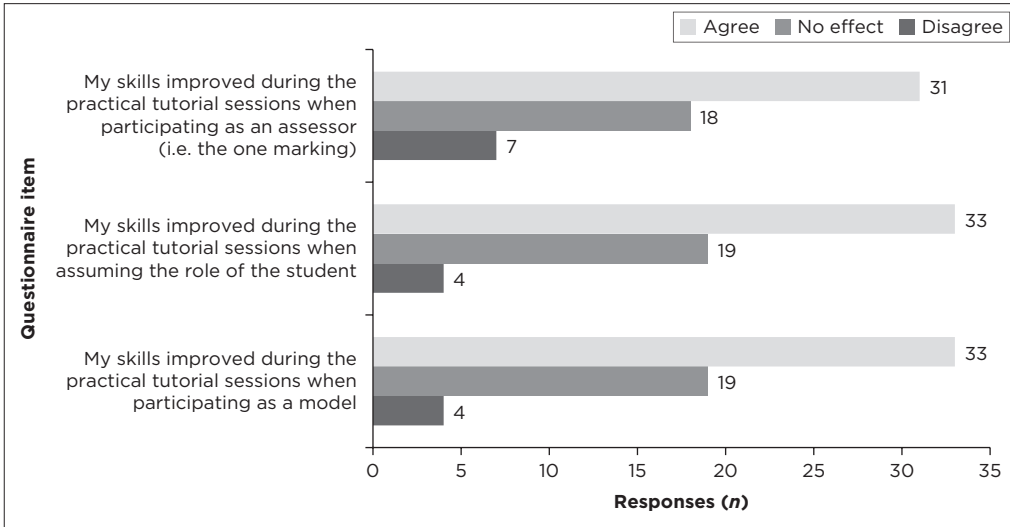


Key: FUSPE, *Fisioterapie Universiteit Stellenbosch Praktiese Eksamen*.

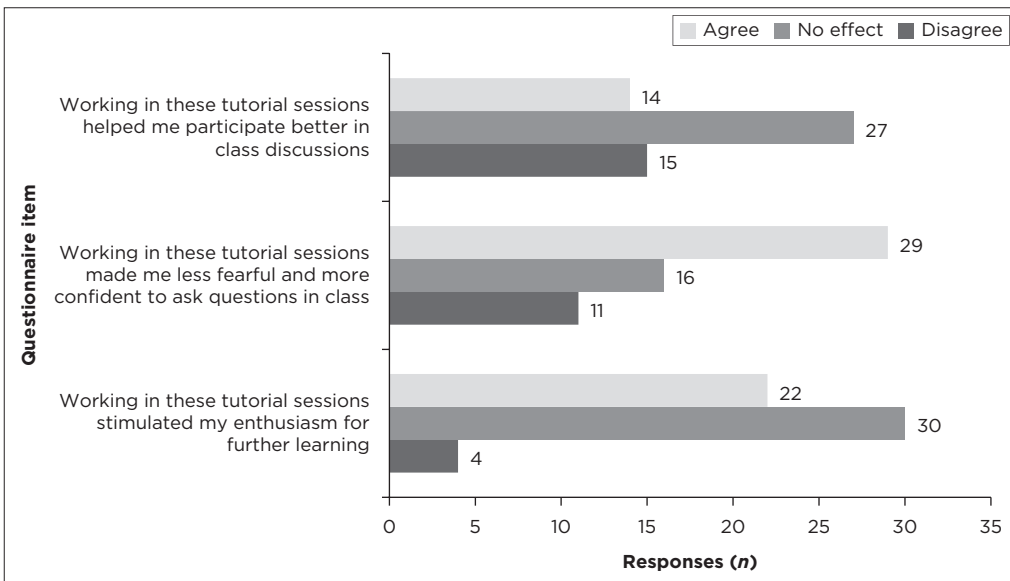
**FIGURE 2.2:** Tutees' perceptions regarding the tutorials' effect on their learning ( $n = 56$ ).

Only 55%–60% of tutees valued the contribution of playing all three roles (doer/student, model and assessor) for improving their psychomotor skills performance (Figure 2.3). Fewer tutees agreed that being a model was beneficial (55%,  $n = 31$ ).

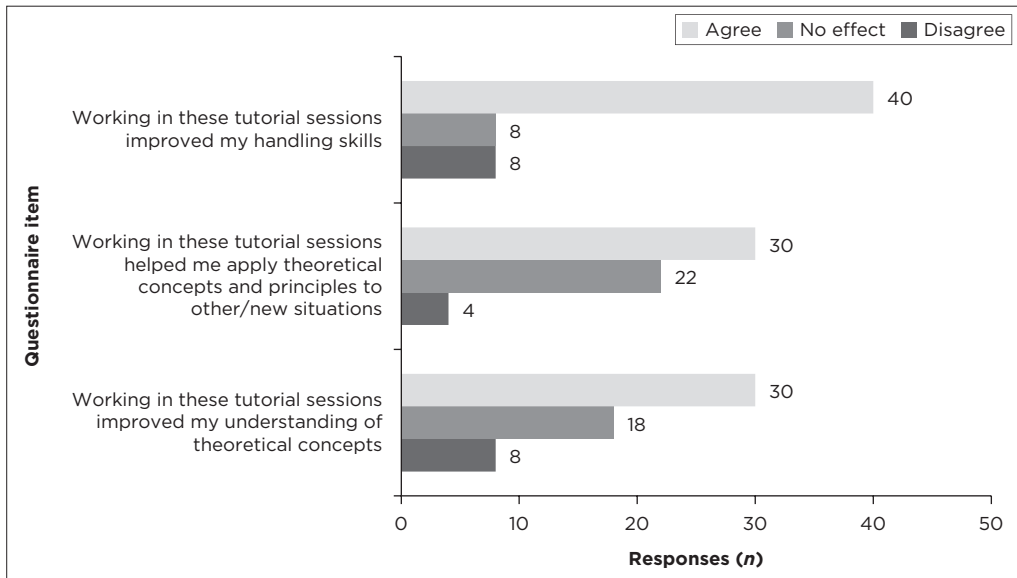
While most tutees agreed that their participation in the tutorials had improved their psychomotor skills (71%,  $n = 40$ ), tutees were more ambivalent regarding the effect of the tutorials on their understanding of the theory or their ability to integrate theory and practice (54%,  $n = 30$ ) (Figure 2.4 and Figure 2.5).



**FIGURE 2.3:** Tutees' perceptions regarding the effect of different roles during the tutorials ( $n = 56$ ).



**FIGURE 2.4:** Tutees' perceptions regarding the effect of the tutorials on the development of specific skills ( $n = 56$ ).



**FIGURE 2.5:** Tutees' perceptions regarding the effect of the tutorials on their academic performance ( $n = 56$ ).

The value of the tutorials for the development of students' academic performance was disappointing (Figure 2.5). Only 25% ( $n = 14$ ) of tutees agreed that the tutorials had helped them to take on a more participatory role in class discussions. It is encouraging that at least half the class (52%,  $n = 29$ ) agreed that the tutorials gave them the confidence to ask questions in class. However, few tutees agreed that the tutorials had succeeded in stimulating their enthusiasm for further learning (39%,  $n = 22$ ).

## ■ Lecturers' perceptions of the near-peer-assisted learning tutorials

Five lecturers participated in the two FGDs. Three main themes emerged and concerned effectiveness, implementation and sustainability of the NPAL system. The next section elaborates on these three themes and presents one or two with substantiating verbatim quotes, with reference to the FGD number and the participant number (e.g. FGD1-P1). All participants were female.

### □ Effectiveness

Lecturers reported that the system was effective for tutees as it benefitted all students in terms of their affective and academic preparation for assessments:

- '[...] it wasn't only the poorer performing students. Actually, those that were doing well, they now had the opportunity to just hone those skills.' (FGD2-P2, F)

- '[...] second-year students who went to the sessions [...] would come back and say how much they benefitted from having those sessions. I had a range of students, [...] and across the board they all benefitted.' (FGD2-P1, F)
- 'I distinctly noticed an improvement in the anxiety levels once the tutor system was underway, particularly in the last two exams.' (FGD2-P2, F)
- 'I think the carry-over, or carry-through of the skills I felt did improve.' (FGD2-P2, F)
- 'It's better than the old system in that there's more structure and the students are definitely covering more techniques than they used to in the older system.' (FGD2-P1, F)

Lecturers also raised concerns about potential barriers to effectiveness:

- 'If they didn't find me (as part of their preparation), then I shudder to think what happened, because then they tried to get to some kind of consensus amongst themselves [...] and that could negate the positive aspects of the tutorials.' (FGD2-P1, F)

Lecturers' perceptions furthermore concurred that the NPAL system resulted in time saved for them as lecturers:

- 'So for me it was time-saving [...].' (FGD2-P1, F)
- 'If anything, for me it was a lifesaver, because normally in a practical session because you divide the class in half, et cetera, et cetera, you end up being involved in four or five hours of practical, whereas now I had the two hours of the tutorials almost all of it for myself.' (FGD2-P3, F)
- 'Yes, look it does not happen every week, but the times that I was involved; you can say yes, time was won.' (Translated) (FGD1-P1, F)

## □ Implementation

Lecturers' experiences shared within the FGDs were predominantly focused on the implementation of the NPAL tutorials. They questioned the readiness of the tutors and emphasised the importance of, and the need for more, capacity-building for tutors regarding their role in group management and facilitation:

- 'The downside for me is that despite the formal structure, the students are still managing to finish in an hour or an hour and a half when it's supposed to be a two- to three-hour session, and I would love to see exactly what they (tutors) do.' (FGD2-P1, F)
- '[...] need to know which techniques or FUSPEs (rubrics) they will have to go through; I think at least a week prior, and then there's more possibilities to meet with them before that, instead of them for example running around on the day of the tutorial.' (FGD2-P3, F)
- I think the logistics did play a role. What I found difficult to incorporate was to have that session prior to the actual tutorial with the third-year tutors.

So I could provide the hardcopy of the FUSPE (OSPE), but for them to actually then have time to go through the detail of it, that didn't happen.' (FGD2-P2, F)

- For me, the frustrating part was the administrative logistics. Because it was something new and we didn't really have enough time to collate, format, it was done under pressure, so that was definitely a negative [...].’ (FGD2-P1, F)
- ‘I think it's still too much of a group activity. The tutors need to be a little bit stricter with sticking to the schedule and not let the second-year students influence the third-year students.’ (FGD2-P1, F)
- ‘The last thing I want to mention is the lack of discipline of the students. Some of them, are taking advantage of the third-year facilitators, and it doesn't matter how strong the third-year facilitator is, if they are actually undermining the facilitator or the mentor, then I think that affects the group dynamic.’ (FGD2-P2, F)

## □ Sustainability

Lecturers' FGDs highlighted the need for formalising relationships between all stakeholders to ensure the sustainability of the NPAL system in the future:

- ‘So, I like the suggestion that there should be a memorandum of understanding. This is my role, this is the role of the tutor, tutee and this is the role of the mentor, so that they can understand each other and can say to one another – but remember you signed, you committed yourself, so now we expect you to keep to that because you influence each other's learning process [...].’ (Translated) (FGD2-P3, F)
- I want to emphasise that there must be better communication between lecturers. Personally I knew very little [...].’ (Translated) (FGD2-P3, F)
- ‘[...] hopefully with them (tutors) know when these sessions are, that when other things happen, or when other meetings are arranged, that they say sorry, but I already have a commitment on that date.’ (FGD1-P2, F)
- ‘[...] they (tutors) must realise they have a responsibility towards this [...].’ (FGD2-P2, F)

Future sustainability is also more likely because a bank of techniques and rubrics is being developed and ready for use in future years:

- ‘[...] and I think now the more that we do it and now that the bank (of techniques and rubrics) is there, the issues with the setting up of the rubrics and supplying the rubrics, that time is also going to become a lot less on us.’ (FGD2-P2, F)

Adopting a more scholarly approach was also suggested to help improve the system and benefits for both tutors and tutees. Long-term follow-up on the impact was recommended to help motivate continued use of the tutorials.

Regular review of the quality of the rubrics used by tutors as a guide for how techniques should be performed was also recommended:

- 'Another suggestion, or something maybe for the evaluation, is also analysing the whole benefit that it had on the tutees and the tutors.' (FGD2-P1, F)
- 'So the more we are certain that the quality of our rubric is good, the less we need to worry about the quality of the third year.' (FGD1-P1, F)
- '[...] now in hindsight – sad that we didn't formally evaluate anxiety levels, because if there was one thing that stood out for me like a sore thumb, yes, the students are nervous, but they are happy-nervous.' (FGD1-P2, F)

## ■ Discussion

This chapter aimed to describe the effect of an NPAL tutorial strategy that was implemented to address the effect of the lack of lecturer capacity for individualised feedback in large classes on physiotherapy students' psychomotor skills competence. The study described in this chapter also aimed to report on the perceptions of both tutees and lecturers on the effectiveness of this novel strategy. Both students and lecturers felt that participation in NPAL tutorials had helped students to prepare more effectively for the OSPEs. This result was reinforced by the finding that a greater proportion of students had successfully completed the OSPEs after participating in the tutorial sessions when compared to usual lecturer-assisted psychomotor training sessions.

Most tutees agreed that the tutorials had helped build their confidence and improved their performance of the physiotherapy techniques, which assisted them in their OSPE preparation. This perception was confirmed by lecturers who reported observing increased levels of confidence and decreased anxiety in students. The students regarded the tutorials as being essential to their academic success. Lecturers perceived the sessions as being effective in that they afforded them extra time to work more productively. The need for generic skills training in areas such as conflict management and time management for senior third-year students, clarification of roles of all participants through a formal memorandum of understanding and continued support of tutors was highlighted in feedback from lecturers.

The results of this study concur with findings from studies conducted in emergency medicine (Charlier, Van der Stock & Iserbyt 2016), medicine (Hughes 2011; Tolsgaard et al. 2007) and nursing (Secomb 2008) that NPAL as a strategy to address increasing student numbers can be effective. However, the successful transition of psychomotor skills learnt in the classroom to adequate performance in the clinical setting is controversial. Although the four studies referred to report benefits in both settings, a more recent

systematic review by Sevenhuysen et al. (2017) reported that the evidence of the effects of PAL in rehabilitation science students (including physiotherapy, occupational therapy and speech therapy) across the domains of satisfaction, perceived learning and performance outcomes is inconsistent. They contend that this matter warrants further exploration (Sevenhuysen et al. 2017). In our context, the transfer of psychomotor skills learnt in the classroom to the clinical setting is yet to be determined.

It could be argued that the promising results of this study are not surprising as the disciplines where the strategy has proven to be effective in developing psychomotor skill competence are all closely aligned with the physiotherapy profession. However, as many of the physiotherapy techniques are not clearly defined and, therefore, open to interpretation and likely to be adapted in different contexts, we were concerned that tutors could potentially confuse students. Therefore, it was reassuring to find that students performed better after participating in the tutorials when compared to lecturer-led practical sessions. We hypothesise that lecturers' close participation in the mentoring of tutors, defining of tutorial content and the provision of structured rubrics contributed to the success of the novel NPAL strategy. We, therefore, assume that the success of this strategy in a physiotherapy programme is dependent on lecturer or faculty involvement and the quality of the tutors and propose that the role of lecturers should transition from being didactic to that of a mentor of tutors, to assist more students in acquiring psychomotor skills in our profession.

Early peer teaching studies questioned the effectiveness of peers teaching complex psychomotor skills, and although much has changed in the last decade, it remains a contentious issue, with most studies unable to substantiate their claim of meaningful learning experience in PAL (Burgess & McGregor 2018; Stigmar 2016). We recognise that students may not have the pedagogical ability to clarify all aspects of complex psychomotor skills, and as such, the system we developed did not replace the classroom but was rather an adjunct that afforded re-enforcement of what had already been done in the classroom setting. Tutors were encouraged to clarify the more complex and potentially critical aspects of the technique with the lecturer before their tutoring session. The tutorials thus provided a structured environment where students could practise techniques and receive immediate cognitive feedback, emphasising the last two steps of the five-step process of clinical skills teaching (George & Doto 2001).

A finding from this study that would be valuable to explore in future research is whether lecturers perceived additional time afforded by the NPAL allowed them to focus on other academic responsibilities. The academic burden on lecturing staff is well documented, with time valued as a scarce resource. This study showed that NPAL could be used to allow lecturers to



utilise available time differently within an academic programme without negatively impacting student learning. Near-peer-assisted learning, in this case, was implemented to assist students with psychomotor skills training, and it would be worth exploring whether there are other academic activities where NPAL may further free up lecturers' time for other academic priorities or, at the very least, to assist with the increasing number of students in the classroom.

A second aspect worth investigating further is whether purposeful selection, that is, selecting a cohort of academically stronger senior students, was responsible for this study's positive findings. Comparison with a cohort of volunteer students, regardless of their academic performance would validate or negate this and potentially increase access to more senior students benefitting as tutors (Unger et al. 2014). According to the Rehabilitation Competency Framework of the World Health Organization, the ability 'to support learning and development of others' and 'work to strengthen rehabilitation education and training' (World Health Organization 2020, pp. 36–37) are critical competencies and as such should form part of the learning outcomes for all professional rehabilitation programmes. The NPAL tutorial in this study afforded only a small group of students a unique opportunity for co-curricular enrichment. Additional opportunities to make the most of the affordances of near-peer teaching and facilitation should be considered to benefit all students.

Skill proficiency is context-specific, and whether our students will demonstrate the similar performance of these classroom-learnt psychomotor skills in the clinical setting remains unknown. In our experience to date, and before implementing this NPAL tutorial strategy, the predictability of the OSPE has been poor and similar to the findings reported by colleagues from another South African physiotherapy programme (Wessel et al. 2003). No studies reporting on the validity and predictability of psychomotor skill competence in the clinical setting of physiotherapy have since been published. Similarly, this study only reports on the immediate effect; therefore, follow-up of these students in the clinical setting is recommended. However, although there is no current evidence on transferability, the Division of Physiotherapy at SUN values the apparent benefit to all students and lecturers, and NPAL is now part of the undergraduate curriculum.

## ■ Limitations

The results of our study must be interpreted with caution. These results are based on the findings of one cohort of students, and the natural progression of skill proficiency over a period of six months could have been the reason for the apparent improvements. Additionally, the findings may not necessarily be generalisable to other groups of students. The impact on the potential

**BOX 2.1:** Recommendations for practice.

Where lecturer-to-student ratios are high, a structured NPAL system can enable individualised and timeous formative feedback to help students to prepare more effectively for the summative assessment of psychomotor skills in resource-constrained health science education environments.

Supplementing existing psychomotor skills teaching with well-structured NPAL may save time for lecturers.

NPAL requires capacity-building interventions to optimise the group management and interpersonal skills of tutors.

To optimise NPAL, ongoing stakeholder review (involving tutors, tutees and lecturers) is recommended to monitor effectiveness and allow for timely troubleshooting.

Key: NPAL, near-peer-assisted learning.

transference of these improvements to performance in the clinical setting, as observed during the OSPE, is yet to be explored. It is hoped, however, that our experience with this method will assist others in optimising student learning, especially regarding psychomotor skills training.

## ■ Recommendations

Box 2.1 outlines recommendations for practice emanating from this study.

## ■ Conclusion

It is concluded that a structured NPAL strategy can be implemented in a physiotherapy module without compromising student learning and the development of psychomotor skills. Such tutorials can assist lecturers in the delivery of quality education in resource-constrained environments where the student-to-lecturer ratios keep growing. According to the participating students, these tutorials provided a safe space within which they could improve their psychomotor skills. In addition, lecturers perceived students as having higher confidence levels and less anxiety when being examined. Whether NPAL can be utilised for other learning activities besides the facilitation of psychomotor skill proficiency should be further explored.



## **THEME 2**

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# **Technology-enhanced education**



# Developing a framework to facilitate clinical learning via WhatsApp

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## ■ Abstract

**Background:** As online tools that promote and facilitate collaboration have increasingly become available, the use of mobile phone technology, such as WhatsApp, has started playing an important role in learning. Engaging student learning using WhatsApp allows for their active participation in building their own knowledge framework, with a shift towards a social constructivist model

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of learning in which knowledge is developed through the exchange and distribution of knowledge. Integrating components of case-based and peer learning via this platform can afford the sharing of information and collaboration to be efficient and effective.

**Aim:** This study aims to suggest a pedagogical framework for using WhatsApp to facilitate case-based peer learning on the clinical platform.

**Methods:** A cross-sectional, convergent, parallel mixed method design was employed. Students' perceptions of the case discussion group as a learning tool were collected using a survey. Descriptive qualitative data included students' written reflections regarding the case discussions and focus groups on their perceptions of the learning framework. Sampling drew participants from the final-year speech-language and hearing therapy students participating in the case discussion groups.

**Findings:** Students reported that the case discussion contributed to their knowledge, the application of knowledge on the clinical platform, the use of self-directed learning and the development of problem-solving skills. The WhatsApp platform was deemed accessible and convenient. Specific suggestions were made for the content and logistical aspects of the framework.

**Conclusion:** The proposed framework suggests a feasible way to bridge the gap between theoretical knowledge and clinical practice in the South African context, using case-based learning offered via a mobile messaging platform to encourage peer learning.

## ■ Introduction

Mobile learning has started playing an important role in enriching and enhancing higher education, as the availability and quality of technology have promoted and eased collaboration (Traxler 2021; Traxler & Vosloo 2014). Mobile messaging services, such as WhatsApp, offer a fast, accessible and affordable way of sharing information rapidly and gaining assistance when needed (Cole et al. 2017; Raiman, Antbring & Mahmood 2017; Zulfikar et al. 2018). As the students of a new generation emerge who are acquainted with the internet, social media and mobile technology, the learning needs of these students are also changing, and adapting the learning environment to suit their needs is crucial (Indu, Kandhol & Cherian 2018). The students have moved past the traditional method of teaching and are increasingly more reliant on online tools to gain knowledge (Mohanakrishnan et al. 2017). They are familiar with mobile messaging services for communication purposes that transcend their personal lives, and an increase in its use for learning and professional purposes has been evident (Cole et al. 2017; Davis, Ho & Last 2015). While there are numerous opportunities to incorporate electronic learning, the mobility of digital technology creates an interesting opportunity for new

forms of learning because of the changing nature of the physical relationships between lecturers, students and objects of learning (Laurillard 2007). Mobile learning is a natural extension of electronic learning and allows learning to be even more widely accessible and available than that in the current electronic learning environments (Brown 2005). Students having access to resources for learning anytime, anywhere and in a variety of formats can potentially enhance deep learning (e.g. demonstration of understanding of concepts, critical thinking, reflection, application and problem-solving) and allow them to construct their own knowledge (Amry 2014).

As a mobile learning platform, mobile messaging services have the potential to increase student participation outside of the traditional classroom setting, improve student-educator collaboration, and facilitate authentic learning and reflective practice (Kaliisa & Picard 2017). As a learning and teaching tool, it has the potential for creating a space in which interaction is key to the learning activity, allowing for active participation in the co-construction of meaning and knowledge in a potentially supported space (Davis et al. 2015; Laurillard 2007; Raiman et al. 2017). By using a familiar mobile platform, a quick and convenient environment is created in which engagement can be tracked, discussions can be recorded and referred to whenever needed, and timely support can be offered (Raiman et al. 2017). Mobile messaging services offer a shift in higher education pedagogy towards the social constructivist model of learning in which knowledge is developed through information exchange and distribution (Davis et al. 2015). In social constructivism, learning is viewed as a social process best achieved through interactions. Using WhatsApp in teaching could offer a platform to effectively implement this learning theory (Indu et al. 2018).

The impact of mobile learning depends on the technology used and the various possibilities it offers within the learning environment. These possibilities to enhance learning must be structured within a carefully developed and designed pedagogical framework to create mobile learning opportunities (Brown 2005). When considering the development of a pedagogical framework using mobile technology, it is important to recognise that the platform offers a capacity to facilitate learning across contexts and reach students wherever they are (Laurillard 2007). The accessibility and collaborative nature offered by the platform highlight the social aspects of learning in the communication that occurs between the teacher and student and between students and peers, during which understanding of concepts based on experience can be shared and shaped through reflection with feedback. These activities should motivate students to consult theory, develop ideas and concepts, ask questions, offer their own ideas, adapt their approach, practice application, share and debate with others, and reflect on learning (Laurillard 2007).

To bridge the gap between theory and practice during clinical placements, case-based learning strategies can be adapted and facilitated via WhatsApp



to encourage student learning that prioritises active inquiry, self-directed learning and development of problem-solving strategies while offering graded facilitation (Raiman et al. 2017; Thistlewaite et al. 2012). Case-based learning also allows students to consider the complexities of clinical case management without the added pressure of real client interactions (Thistlewaite et al. 2012). A pedagogical framework was therefore created to include peer- and case-based learning via WhatsApp to facilitate learning on clinical placements. For these WhatsApp case discussions, fictional, real-world cases were generated and presented via WhatsApp with graded prompts posted at set intervals, which allowed students to explore their responses and discuss aspects of the case with one another at a time convenient to them on their clinical placements. The aims were to (1) develop students' understanding of key clinical concepts necessary for clinical practice in a time and cost-effective manner, (2) utilise a mobile messaging platform as an accessible mobile learning tool and (3) develop problem-solving strategies for addressing the often-complex nature of clinical case management.

Social constructivism proposes that learning, including knowledge development and understanding of concepts, is developed in interaction with one another. Leeds-Hurwitz (2009) suggested that the two important elements of social constructivism included the experience of rationalisation through the experience of the social world and the construction of reality through language. Constructivist learning theory can be applied through peer learning that emphasises the social process of learning through which students exchange, compare and reconstruct ideas to build their knowledge framework (Göğüş 2012). Peer learning allows students to learn from one another through structured interaction. Learning is the outcome of social interactions between students engaging collaboratively in learning activities, such as discussion forums on mobile devices, where new understanding is shared (Amry 2014). Peer learning focuses on collaborative and cooperative learning. Discussion forums, as provided by WhatsApp, promote the development of learning communities, thereby enhancing the process of learning and promoting lifelong learning (Amry 2014). Case-based learning can benefit from this co-construction of meaning.

Case-based learning, a learning activity in health professional education, commonly utilises clinical cases and can be viewed as a type of inquiry-based learning. Inquiry-based learning, in turn, emphasises the social constructivist approach to learning in which knowledge is acquired through a series of steps and a group process (Thistlewaite et al. 2012). Guided and structured inquiry in case-based learning allows the practice of clinical problem-solving without the added pressure and unpredictability that accompany real-life client interaction by exposing students to real-life scenarios using authentic clinical cases. It creates a platform in which theory can be applied to practice in a controlled environment. It also offers exposure to a wider range of clinical

problems that may not be encountered on clinical placements, offering students the opportunity to go through the problem-solving and decision-making process that they might not otherwise have encountered (Thistlewaite et al. 2012).

Case-based learning aims to prepare students for clinical work by using authentic clinical cases, linking theory to practice by applying knowledge to the case (Thistlewaite et al. 2012). Promoting self-directed learning, clinical reasoning, and problem-solving and decision-making in the clinical context are a few of the advantages of case-based learning (Richards & Inglehart 2006). The revised version of Bloom's taxonomy (Anderson & Krathwohl 2001) offers a platform for designing learning and teaching activities, which suggests foundational knowledge in remembering and understanding components of learning before moving to higher cognitive integrations that include application, analysis, evaluation and creation. When students enter clinical training, the foundational knowledge has already been covered in theoretical modules, and students are expected to start applying their knowledge to real-world situations. Clinical problem-solving often requires a deductive thinking approach, which includes broad considerations to focus and refine client-specific clinical approaches. Engaging students in higher levels of Bloom's taxonomy encourages self-directed learning that helps them link theory to practice. By encouraging engagement in higher levels of Bloom's taxonomy, students can identify gaps in knowledge and be exposed to real-life practical problem-solving. Moving to lower levels of the taxonomy then helps them to link specific components of their theoretical knowledge to the clinical problem at hand.

Research has demonstrated several benefits of using WhatsApp as a tool to facilitate learning. It is easy to use, familiar (no need to teach its use) and used by most in everyday life (Raiman et al. 2017). The ease of use and access has also yielded positive effects on participation (Raiman et al. 2017). It is a 'low-cost and fast technology' that can help minimise the perceived hierarchy among students and facilitators and encourages active discussion in the health care setting (Boulos, Giustini & Wheeler 2016). It can also facilitate communication surrounding both organisational and clinical aspects of health care and learning, allowing for real-time support, sharing of resources and easy access to previous content for reference and learning purposes (Raiman et al. 2017). Mobile learning has also been shown to enhance the feeling of control and ownership among students, which encourages participation in learning activities (Laurillard 2007).

While WhatsApp provides many potential educational possibilities, it is also accompanied by some potential risks. If used during clinical or classroom contact time, it can serve as a source of distraction, compromise professionalism and blur the boundaries between personal and professional identities (Davis et al. 2015). Providing adequate training surrounding online professionalism is

therefore important to reduce these risks and incorporate well-thought-out strategies to facilitate engagement to reduce distractions (Davis et al. 2015). Another potential risk involves the threat to the protection of client confidentiality, and clear guidelines are needed to navigate the medicolegal and ethical aspects of the use of the platform (Boulos et al. 2016). The lack of face-to-face interaction and loss of non-verbal communication have also been identified as potential risks, as it might be difficult to identify when someone does not understand a concept (Raiman et al. 2017).

Mobile learning within Africa may, however, be controversial because of the lack of infrastructure, but Brown (2005) noted that the growth of wireless access is even more rapid in the African context than in high-income countries. Poor technological infrastructure, limited access to modern mobile devices and the lack of pedagogical skills among lecturers about mobile learning are but a few of the significant challenges to integrating mobile learning in higher education institutions in Africa (Kaliisa & Picard 2017). Encouragingly, by the end of 2019, 477 million individuals had subscribed to mobile services in sub-Saharan Africa. This represented 45% of the region's population, with an estimated adoption rate of 65% of smartphones by the end of 2025 (GSMA 2020). With this growth in mobile penetration, interest in utilising mobile devices in higher education has been generated. This is because of it being an approach with the potential to increase access to higher education in developing countries (Davison & Lazros 2015).

It is therefore clear that the development of a pedagogical framework for mobile learning on the clinical platform needs to focus on the benefit of peer learning by using case-based learning.

## ■ Research question

What pedagogical framework can be used to include case-based, peer learning via WhatsApp to facilitate the development of theoretical applications in the clinical environment?

## ■ Purpose of the study

The purpose of the study was to suggest a pedagogical framework for using case-based peer learning via WhatsApp to facilitate the development of theoretical applications in the clinical environment.

## ■ Objectives

- To explore the perceptions of fourth-year speech-language and hearing therapy (SLHT) students on using case-based peer learning by mobile messaging technology to inform the pedagogical framework.

- To identify elements for inclusion in the pedagogical framework to facilitate clinical development.
- To consider students' suggestions in the design of learning and teaching packages when using the pedagogical framework.

## ■ Methods

### ■ Study design

A convergent, parallel mixed method design was utilised to determine the perceptions of students using case-based peer learning via WhatsApp to support clinical training and problem-solving on the clinical platform (Creswell & Plano Clark 2011; Wium & Louw 2018). This design aims to gather different types of data about the same topic to compare, validate and triangulate results to ensure a complimentary picture of how case-based peer learning could impact learning in students (Creswell & Plano Clark 2011). The intent of using this research design was to analyse the quantitative and qualitative data separately and then to compare or relate information during the interpretation of results.

The quantitative data were collected using a self-developed survey focusing on the logistics, content and attitude of students participating in the case-based peer learning using the case discussion WhatsApp group. Survey research allows for time and cost-efficient research but lacks the details and depth (Kelley et al. 2003). A descriptive qualitative approach was followed to gain insight into the students' experiences of the proposed pedagogical framework based on what was used and the students' experience thereof (Kim, Sefcik & Bradway 2017). This approach was deemed suitable as a clear description of information was needed from those experiencing it directly to refine the pedagogical framework (Bradshaw, Atkinson & Doody 2017). The qualitative data were obtained through focus groups, including students who had participated in the case discussions, to gain their perceptions of the experience of engaging with the pedagogical framework. The semi-structured focus group interviews allowed the students to discuss their experiences and perceptions of case-based peer learning and how it facilitated clinical support. The second source of qualitative data was the reflections students completed after each case discussion during the six-week programme, which focused on their perception of their learning experience of the case discussion.

### ■ Study population or setting

In 2019, a total of 33 SLHT students were enrolled in their final year of study at Stellenbosch University. They rotated through four six-week clinical rotations. Two of these clinical rotations included a focus on adult neurogenic communication disorders.

**TABLE 3.1:** Inclusion and exclusion criteria.

Inclusion criteria	Exclusion criteria
Currently completing clinical rotations focused on adult neurogenic communication disorders	Currently participating in clinical rotations where no clients with adult neurogenic communication disorders were seen
Mobile phone in working order with WhatsApp installed	Technical difficulties (lack of data or connectivity issues) with WhatsApp

## ■ Study participants

The study sample consisted of 17 students who were involved in clinical training involving adult neurogenic communication disorders during the second semester of 2019. The case discussion WhatsApp group was facilitated by clinical educators on these platforms. These case discussions formed part of the clinical rotations, and therefore, all the students had an opportunity to participate in the programme.

## ■ Sampling

Convenience sampling was used, and students were included based on their availability and willingness to participate in both the quantitative and qualitative data collection procedures and their ability to communicate their experiences and opinions (Palinkas et al. 2015). Convenience sampling was guided by the selection criteria outlined in Table 3.1.

Students were completing clinical rotations that included working with clients with adult neurogenic communication disorders, and they could use the knowledge gained from the case discussion in their clinical work on these rotations. Students needed to be familiar with WhatsApp. Students experiencing technical difficulties with WhatsApp, including Wi-Fi connectivity issues or lack of data, were able to gain access to the information by downloading the messages once the case discussion was completed, which was made available on the university's electronic learning platform.

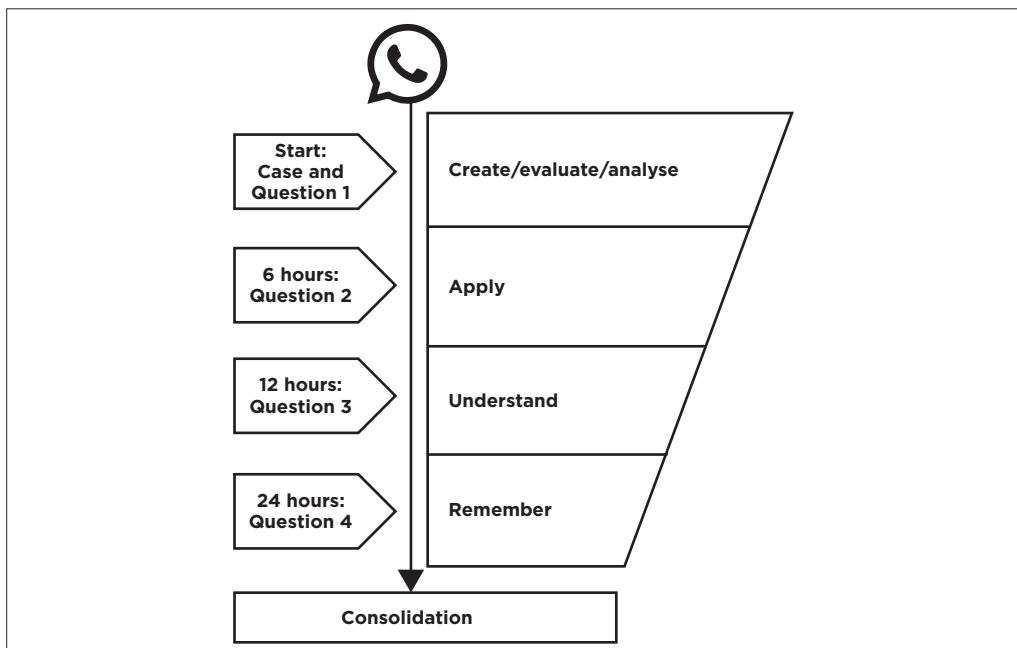
## ■ Pedagogical framework development

A six-week case discussion WhatsApp group programme was developed and introduced on the clinical platform. It was based on case-based learning, in which real-life clinical scenarios, in the form of case studies, were designed to promote student learning development on the clinical platform.

A facilitator focus group was held to determine the possible concerns and basic skills that the students needed to obtain while participating in the clinical rotation. This focus group aimed to ensure that comprehension of clinical case studies was targeted, to ensure that all students had the same baseline knowledge in an already time-constrained clinical rotation and to provide the students with some independent problem-solving skills. Fictional case studies were developed

in response to specific clinical concerns raised during the facilitator focus group. Although the cases were less complex in comparison with cases seen on the clinical platform, the aim of the programme was to provide the students with a baseline of knowledge and a good starting point to assess and treat clients with more complex difficulties. The aim was also to guide students from more complex to simple questions related to the fictional case. This allowed students to develop the necessary problem-solving skills when approaching clients seen on the clinical platform. Table 3.2 provides an example of the case and questions included for a community-level interdisciplinary approach to client management. The six-week case discussion WhatsApp group programme ran concurrently with the students' clinical rotation, which provided them with client cases with varied diagnoses in the same clinical population as the case scenarios provided.

The facilitators posted the predetermined questions, which were based on a deductive approach moving from higher to lower levels of Bloom's taxonomy, every 6–12 hours, to ensure prompt discussion and inquiry and to guide the learning process. Students were encouraged to not only contribute but also consider and respond to each other's contributions. Limited input was provided by the facilitators during the discussions, as peer learning was encouraged. Simultaneously, students built their own knowledge and shared their knowledge and experience with their peers. The contributions made in the discussion were consolidated into a summary and provided to all the students upon completion of the discussion. The pedagogical framework employed is outlined in Figure 3.1 and see Table 3.2 for an example of the case discussion format.



**FIGURE 3.1:** Framework of case-based, peer learning programme when using WhatsApp as a learning tool.

**TABLE 3.2:** Example of a case discussion format developed for community-level management of clinical neurogenic communication disorders from an interdisciplinary team perspective.

Stage of discussion	Content	Bloom's levels
<b>Case background</b>	Mrs G.: 46-year-old female, married, with a 14-year-old son. Suffered a stroke two months ago and experienced severe apraxia of speech, used a wheelchair and was responsible for maintaining the household pre-morbidly. [Images of home environment included.]	-
<b>Question 1</b>	Evaluate the environment in the photographs of Mrs G's home with an interprofessional focus.	Create, evaluate, analyse
<b>Question 2</b>	How could we approach combined goals within the interprofessional team?	Apply
<b>Question 3</b>	Explain your understanding of functional therapy.	Understand
<b>Question 4</b>	Compare and contrast 'multidisciplinary team' with 'interprofessional team'.	Remember

## ■ Procedures

The first step included obtaining ethical and institutional permission (N19/08/105). The six-week case discussion WhatsApp group programme was then implemented. Upon completion of the programme, students were asked to complete a survey, participate in a focus group and give permission for their weekly reflections on their learning experiences during the rotation to be analysed. These three data-gathering instruments informed the initial suggested pedagogical framework for case-based peer learning using WhatsApp. Students provided written informed consent and completed the survey a week after completing their clinical rotations. The informed consent, available in both Afrikaans and English, explained the potential risks and benefits to the participant and that the focus groups would be audio-recorded. Special attention was paid to the possible power dynamic between clinical educator and students.

The paper-based surveys were completed and dropped in a postbox in the administrative office of the Division of Speech-Language and Hearing Therapy to ensure anonymity. Students who indicated their willingness to participate in the focus groups were divided into two groups. A person independent of the researchers conducted the focus groups to ensure objectivity and allow students to provide information without feeling intimidated. The focus group interviews were recorded and transcribed. Students' reflections were completed weekly via Google Forms during the clinical learning process and were compulsory. Permission was obtained to use reflections as part of the data set. Paper data were stored in a locked cabinet in the Division of Speech-Language and Hearing Therapy, and all digital data were stored on a password-protected laptop. All data will be kept for five years and then destroyed.

## ■ Data collection

No biographical information was collected during the data collection process as it was not needed for data analysis. The data collection instruments

focused and aligned with the research objectives, which included the student's perceptions of content, attitudinal and logistical aspects to guide the development of the pedagogical framework for case-based, peer learning.

## ■ Quantitative data

Data were collected via a survey that focused on students' perceptions using the case discussion WhatsApp group as a learning tool. A survey, based on Zulfikar et al. (2018), was used to focus on the operational, attitudinal and content aspects of participating in the case discussion group. Part A (seven multiple-choice questions) focused on operational questions. This included questions regarding the students' perceptions of the frequency, complexity and level of comfort when participating in the case discussion WhatsApp group. Part B (five multiple-choice questions) obtained information regarding their attitudes when participating in the case discussion group, and Part C (six multiple-choice questions) obtained data regarding the content covered.

## ■ Qualitative data

Students wrote reflections as part of the clinical learning module and submitted them via Google Forms. The reflections were based on five questions. For this study, only question three, which was related to their experience of the case discussion and what worked or did not work, was included in the data set.

A semi-structured interview schedule was developed to guide the interviews in the focus groups. As per Table 3.3, the interview schedule questions and prompts focused on the same broad topics, including logistics, attitudes and content of the case discussion WhatsApp group.

**TABLE 3.3:** Interview schedule.

Questions	Cues
What do you think about using mobile messaging technology on clinical platforms?	Benefits, limitations
What do you think about the operational strategies (the 'how' it was done) used during the case discussion group?	Frequency of questions, frequency of feedback from the facilitator, leading questions and comfortability with a facilitator
How do you feel about using the case discussion group in conjunction with your clinical rotation?	Experience, motivation, self-assessment of knowledge
What do you think about the content of the case discussion group?	Complexity, facilitate problem-solving, theoretical, clinical
Any recommendations and suggestions for future use of the case discussion group?	-



## ■ Data analysis

### ■ Quantitative data

Data collected from the surveys were organised according to the objectives and recorded on an Excel spreadsheet. Quantitative data were used to descriptively portray the responses provided. Descriptive statistics included percentages and frequencies of responses as well as the mean or median of each response.

### ■ Qualitative data

Reflections were depersonalised before analysis to ensure anonymity. Focus groups were conducted by an independent, experienced interviewer. Focus group interviews were transcribed verbatim, and transcriptions used codes to ensure the omission of all identifiable information. A hybrid approach to inductive and deductive coding and theme development was employed. The steps for analysing qualitative data recommended by Bless, Higson-Smith and Sithole (2013) were employed, which are given as follows: (1) immersion into the data to ensure all data are complete and the researcher is aware of all the data, (2) preliminary coding, (3) defined coding and sub-codes and (4) confirmed coding through inter-coding using a trained researcher. Comprehensive descriptive summaries of themes, codes and sub-codes were presented with the necessary supporting quotations.

## ■ Reliability and validity of quantitative data

### ■ Internal validity

Content validity was ensured by asking the facilitators to act as expert reviewers to evaluate the adapted survey and was used to gain information regarding the perceptions of students using the case discussion group. The content validation was subjectively done to evaluate the questionnaire (Orlikoff, Schiavetti & Metz 2015) rationally and logically. The expert reviewers ensured that the survey reflected the aim and objectives of the study.

### ■ External validity

Using an appropriate research sample and applying inclusion and exclusion criteria aimed to increase the generalisability of the research findings. To increase replicability, the research methods were explicitly stated (Zohrabi 2013).

## ■ Reliability

The consistency of the instrument was ensured using referencing of other studies to increase the internal reliability as other studies provide a framework of reference. In this study, the survey used by Zulfikar et al. (2018) served as a reference and influenced the framework of the survey.

## ■ Trustworthiness of qualitative data

### ■ Credibility

Data triangulation through the use of both quantitative and qualitative approaches ensured a more accurate representation of the participants' perceptions of the phenomena.

### ■ Transferability

The use of a representative sample increases the extent to which the research findings could be used in a larger population (Krefting 1991). This was ensured by outlining the inclusion or exclusion criterion and providing detailed information regarding the methodology and materials.

### ■ Dependability

Detailed descriptions of the data collection, analysis and interpretation of data aimed to increase the consistency of the research findings. The code-recode procedure also ensured that consistent results were obtained.

### ■ Confirmability

Interviewer bias was reduced by employing an objective interviewer to conduct the focus groups.

## ■ Results

The results aimed to describe the students' perceptions of the pedagogical framework and how it facilitated learning as well as their suggestions and recommendations regarding possible changes to the framework. The quantitative and qualitative results will be outlined separately but integrated and compared in the discussion.

### ■ Quantitative results

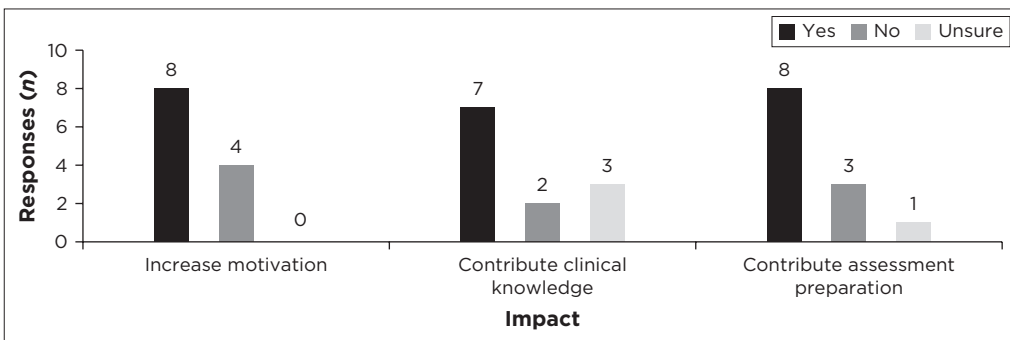
Twelve of the 17 (71%) possible participants completed the paper-based survey that focused on the content, attitudinal and operational-related

questions of the pedagogical framework. One participant did not complete the content section, resulting in a total of eleven respondents for this section.

All the participants ( $n = 11$ ) agreed that the content included provided them with adequate baseline knowledge and reflected what was happening on the clinical platform. Interestingly, even though an inverted Bloom’s taxonomy was used, seven participants indicated that follow-up questions increased in complexity, two participants indicated that questions decreased in complexity and two participants indicated that the four questions were too complex throughout the cases.

The focus of the case discussion content was to develop problem-solving skills when faced with similar cases. Eight participants indicated that the content developed some independent problem-solving skills, and three participants indicated that they developed minimal independent problem-solving skills. Interestingly, none of the participants developed full independent problem-solving skills based on the content. Even though problem-solving skills were not fully developed, the case discussion group assisted with the integration of theory into clinical skills. Eight of the eleven participants agreed that the cases include a variety of theoretical content of clinical aspects, while three students indicated that little to average variety is present. Seven of the eleven students agreed that the pedagogical framework bridges the gap between theoretical knowledge and clinical application, two students indicated that the framework failed to do so and two students were unsure. Seven participants rated the content of the cases as average complexity, while the remaining five students rated it as difficult.

The content included was mostly rated as positive, and this was reflected in the attitudinal section of the survey. Ten of the participants reported the learning experience as average ( $n = 3$ ), above average ( $n = 3$ ) and highly informative ( $n = 4$ ). Only two participants indicated the learning experience as below average. The participants also rated the effects the learning experience had on their motivation, clinical knowledge and assessment preparation as displayed in Figure 3.2.



**FIGURE 3.2:** The impact of participation in the case discussion group.

Most students agreed that participation increased their motivation ( $n = 8$ ), contributed to their clinical knowledge ( $n = 7$ ) and assisted their assessment preparation ( $n = 8$ ), which included oral presentations. Four of the participations indicated no increased motivation, two indicated no contribution to their clinical knowledge and three indicated no contribution to their assessment preparation. Three participants were unsure about the contribution to clinical knowledge, and one participant was unsure about the contribution to assessment preparation. Participation was also influenced by how comfortable participants were interacting with facilitators. Eight participants expressed average comfortability to very comfortable, three participants expressed slight comfortability and one participant was uncomfortable interacting with the facilitator.

While the students' attitudes and the content of the cases could influence the possible benefits of the case discussion group, the operational elements of the pedagogical framework were also assessed. Most students ( $n = 11$ ) posted 0–10 messages in a 36-hour cycle in response to the four questions, and only one student responded with between 10 and 20 messages. Participants gave a variety of preferences when asked about the frequency of the case discussions. Four participants preferred once a week, one participant preferred twice a week, five participants preferred once every second week and two participants preferred twice per rotation (six weeks). Most of the participants ( $n = 5$ ) preferred a 24-hour cycle for engagement per case, and two participants preferred twelve hours or less, with one participant preferring twelve hours and one participant preferring six hours. Only two participants preferred the 36-hour cycle that was used in the current pedagogical framework, and three participants preferred a 48-hour cycle.

In the current pedagogical framework, the facilitators posted four questions. The first question was posted along with the case. Most participants felt that all the questions should be posted at the start of the session and not at intervals, while three participants were happy with six-hour intervals, two participants were happy with eight-hour intervals and one participant preferred a twelve-hour interval between questions. Facilitators did not intervene in the current framework; they summarised the comments and provided feedback at the end of the discussion. Nine of the participants preferred facilitator input every few hours ( $n = 4$ ) or often ( $n = 5$ ). Two participants indicated a preference for regular input and one participant preferred at least one intervention. The preferred framework based on the quantitative results would thus be a case discussion every two weeks, using a 24-hour cycle, with all the questions posted at once at the start, along with the case and the facilitator as an active participant.

## ■ Qualitative results

The qualitative results were based on the two focus groups, which consisted of six participants each, as well as the reflections completed at the end of

their rotation. The focus groups addressed logistic, attitudinal and content-related perceptions regarding the pedagogical framework. The participants' reflections focused on both the learning experience and how they would apply their new knowledge. For the aim of this chapter and to inform and develop a framework, only the component associated with their experience was included in the analysis and coding process. The focus groups and written reflections were coded using ATLAS.ti web-based software (Version 21) for qualitative data analysis and research, following both deductive and inductive coding approaches. Deductive coding used existing codes, including logistics, content and attitude. Inductive coding was used to develop new codes, such as knowledge and peer learning. The codes were grouped into themes and sub-themes as outlined in Table 3.4. Verbatim quotes are used to support the results from both student reflections (i.e. REF) and the respective focus groups (i.e. FG1 or FG2).

**TABLE 3.4:** Representation of themes, sub-themes and codes generated during data analysis.

<b>Theme</b>	<b>Sub-theme</b>	<b>Codes</b>
<b>Learning</b>	<b>Knowledge</b>	Knowledge gap
		Exposure
		Self-directed learning
		Social aspect of learning
	<b>Content</b>	Appropriateness
		Resource
	<b>Application</b>	Carry-over
		Reflection
	<b>Experience</b>	Learning space (questions)
		Indirect teaching
Direct teaching needs (Q&A, prompting, moderation)		
<b>Attitude</b>	Emotional response (peer comparison, judgement, anxiety)	
	Participation (workload/novel)	
<b>Platform (WhatsApp)</b>	<b>Benefits</b>	Accessibility
		Modality (photographs/videos/voice notes)
	<b>Limitations</b>	Linear approach
		Personal vs professional (invasiveness)
		Anonymity
<b>Logistics</b>	<b>Group size</b>	Facilitator
		Barriers
		Suggestion
	<b>Timing</b>	Facilitator
		Barriers
		Suggestion
	<b>Format</b>	Facilitator
		Barriers
		Suggestion

Key: Q&A, question-and-answer.

## □ Learning

### □ *Knowledge*

The case discussions provided students with exposure to clinical diagnoses that they had not previously encountered, which is beneficial because uniform exposure to diagnoses across their clinical training is not possible, as indicated in the following reflection: 'I felt a bit unsure to share ideas because I do not have first-hand experience with an aphasia patient, so it really was a good learning experience' (FG1, P08, 2019). Engaging in the case discussions also allowed them to learn, gain confidence and identify gaps in their knowledge relating to the clinical population managed in the rotation. Several students indicated that they were encouraged to address these knowledge gaps using self-directed learning via additional reading and resource searches. Peer learning was encouraged by sharing their contributions during the case discussions. Students experienced the case discussions and sharing their ideas as enjoyable and informative. They noted that they could build on each other's ideas and responses, consider additional ideas and expand their knowledge base.

### □ *Content*

Students had mixed responses regarding the content of the case discussions. Some viewed it as challenging as they had not seen clients with similar diagnoses on the clinical platform, while others noted that the content reflected common problems. This was also reflected by one of the students in the focus group: 'I prefer it if we have cases that you do not see a lot so that we can reason through them' (FG2, P04, 2019). Although the cases were graded and varied in complexities, they still commented that it was appropriate, relatable and relevant. They indicated that the more complex cases facilitated clinical reasoning skills. The summaries provided at the end of the discussion were deemed extremely helpful and used as a point of reference on the clinical platform. Suggestions made regarding the content included the use of real-life cases that students deem challenging, the inclusion of additional contextual factors to consider during case discussions, the inclusion of specific clinical diagnoses and a greater focus on application.

### □ *Application*

Students used the knowledge gained from case discussions and summaries and applied it to similar clinical cases seen on the clinical platform. They also used the learning experience to reflect on their current cases to inform the assessment and management of their clients as demonstrated in the following quote:

'[/]t was just really useful because I was like so overwhelmed that I had no idea [...] It was my first time seeing this and then just to like share ideas [...] it was really helpful.' (FG2, P01, 2019)

## □ **Experience**

Students felt that the case discussion offered a safe space to discuss ideas but noted that it was not the correct space to ask questions even though the facilitators encouraged this at the start of the case discussion as reflected in the focus group: 'I don't think any of us ask questions really on the forum because I don't think it felt like the right type of place' (FG1, P05, 2019). The focus groups highlighted direct teaching needs, which included the opportunity to ask questions, moderation of answers by the facilitator and facilitators' input and feedback to ensure that contributions were appropriate, as well as face-to-face discussion time. Face-to-face discussions upon completing the case could be used to ask questions, clarify difficult concepts and discuss the summary provided. Their indirect teaching needs included more regular facilitator contact and feedback within the case discussion.

## □ **Attitude**

Although most students enjoyed the social aspect of the learning experience and learning from their peers, the case discussion also evoked emotional responses. They reported being anxious about being judged on their contributions by their peers and facilitators. They also experienced anxiety around the number of messages posted before they could look at the questions, as they were aware of contributions being posted while working with clients. Some students mentioned that they observed competitiveness in terms of who could post the best contribution, as seen in the following reflection: 'at times it felt as if the students were trying to one-up each other as if it was a competition as to who knew the most' (REF, P01, 2019).

Some also felt that they did not know enough, and it made them wonder about how they would cope once they were qualified. Students were especially afraid of their knowledge being judged by the facilitator as not being good enough. Their demanding workload and the novelty of discussing and learning through the WhatsApp platform also contributed to their anxiety.

## □ **Platform**

### □ **Benefits**

Most students agreed that using WhatsApp as the platform was extremely convenient and accessible as most students generally have their phones with them. Students noted that they could read the contributions while in bed or when they had time available. Another benefit they noted was the ability to use different modalities such as voice notes or pictures when contributing to the case discussion, as mentioned in the focus group: '[...] with WhatsApp you can also send voice notes, so it's easier to explain your ideas rather than taking time to type [a message]' (FG2, P01, 2019).

### □ **Limitations**

One of the most obvious limitations identified by the students was the constant need for connectivity. The linear format in which contributions appear on WhatsApp was also identified as a limitation. They found it cumbersome to scroll through all the contributions. They also mentioned that this made it difficult to follow the discussion and that commenting on an earlier post could disturb the flow of the discussion. Students also felt that using WhatsApp could be quite intrusive as a messaging application used for personal purposes was now also being utilised for learning, as mentioned in the focus group: 'I feel like WhatsApp is a bit [...] It felt a bit intrusive to have my work life mixed with my personal, social communication' (FG1, P05, 2019). They felt that the professional learning or work aspects of their life was crossing over into their personal space. The lack of anonymity was a great limitation for students, especially those who were unsure of their contributions to the case discussion.

### □ **Logistics**

#### □ **Group size**

The students preferred smaller groups as the number of WhatsApp contributions would be less and therefore easier to follow the discussion as indicated in their reflections: 'A smaller group may work better' (REF, P11, 2019). Students also felt that in large groups, it seemed like the most important contributions were mentioned early by a few students leaving the rest unable to participate in the discussion.

#### □ **Timing**

Students felt that the timing of the case discussions and posting of the related questions worked as it allowed for flexibility. Most students are busy during the day and could therefore respond to questions at their convenience, as noted in the student's reflection: 'Appreciated the fact that it could be completed in my own time' (REF, P10, 2019). They also felt that there was sufficient time to consider the questions and do research when needed. One student commented that the staggering of questions allowed her to focus on one aspect at a time. Students also preferred questions to be posted after clinical time or at night as it allowed them sufficient time to respond, as questions posted during the day were poorly answered because of their workload. One student also noted that conducting the case discussion over two days prolonged it unnecessarily. Suggestions made by the students included considering the demands of the clinical platform when posting questions to provide them with an equal chance to respond, posting all the questions at the start instead of staggering them and setting a time limit for



responding to questions to avoid having contributions being made at different points throughout the case discussion. The following reflection included some of the suggestions: 'After each question there should be a cut-off so that new answers do not get confused with old ones' (REF, P11, 2019).

### □ **Format**

A positive response to the case discussion format was noted. Students commented that the case information was like what is received when allocated a new client. They found the additional resources and pictures provided to be useful. The varied focus of the questions for each case was preferred by one student. Although no limitations were noted, suggestions were made regarding the format as seen in their reflections: 'I think it would be better for the tutorials to be on a Friday at a set time so that everyone could give input and participate' (REF, P03, 2019). This included asking students to respond to the summary at the end to allow for additional questions.

In summary, most students appeared to benefit in various ways from the case discussion group. Both the quantitative and qualitative data support the contribution to their knowledge, the application of knowledge on the clinical platform, the use of self-directed learning and the development of problem-solving skills. The content covered a wide variety of cases of varying complexity which contributed to their learning process. Although the learning process and experience were deemed valuable, especially with increased motivation and self-confidence on the clinical platform, student participation was affected by fear of their contributions being judged by peers and facilitators. Logistical facilitators and barriers were identified in terms of group size, timing of the case discussion, questions posed and the format. The students preferred small groups, noting that this would reduce the number of messages posted. Taking the current clinical platform into consideration, the case discussions should be structured around available time on the roster, thus allowing each student an equal chance to participate. Both data sets indicated that students preferred a case discussion fortnightly and that it runs over 24 hours. Although students learned from their peers, they suggested increased participation from the facilitators and even a face-to-face session to summarise and answer any additional questions about the case. Both the quantitative and qualitative results were incorporated into the suggested pedagogical framework. The necessary adjustments and suggestions were implemented and will be discussed.

## ■ **Discussion**

Case discussion groups via WhatsApp is a form of mobile learning that was implemented to assist students with bridging the gap between their theoretical knowledge and clinical competence through guided questions using an

inverted Bloom's taxonomy. The suggested pedagogical framework was implemented on the clinical platform to increase students' learning and contribute to their clinical training.

The students reported that the case discussions encouraged self-directed learning, which is recognised as an advantage of using the WhatsApp platform as an educational tool (Raiman et al. 2017). It is also a noted benefit of case-based learning, which is promoted by providing students with clinical scenarios with related questions (AlQahtani & Atta 2015). Self-directed learning ability has been linked to problem-solving abilities (Hwang & Oh 2021). The case discussions, therefore, encouraged the development of problem-solving skills that could be transferred to the clinical environment with a similar, new or difficult diagnosis. Problem-solving skills developed using the case discussions encouraged students to reflect on their caseload on the clinical platform and informed adjustments made to their management plan.

The case discussions based on the framework, therefore, facilitated peer learning through the collaborative engagement offered by the mobile platform (Rambe & Bere 2013) and case-based learning (Cole et al. 2017). The students could also get feedback on their ideas regarding the differential diagnosis, assessment and management of a specific type of case before implementation on the clinical platform. Peer learning, therefore, provided a non-threatening space for students to learn from peers by drawing benefits from those who already had clinical experience with specific cases while also developing their own knowledge. Peer learning, specifically on the WhatsApp platform, allowed for the use of voice notes, pictures, GIFs and emojis during the discussion. The use of the different formats supports and enhances students' learning experience and facilitates the retention of information.

Students were using the case discussions and the summary provided as a resource on the clinical platform. The information was easily accessible via the summary, and students could revisit the contributions when preparing for a client. They could also review the discussion and summary after seeing a client to aid in the differential diagnosis or assist with management planning, as the information and resources were available in an accessible space. The benefits of the case discussion were therefore far more than mere exposure to clinical cases but also provided a resource for future learning and clinical practice.

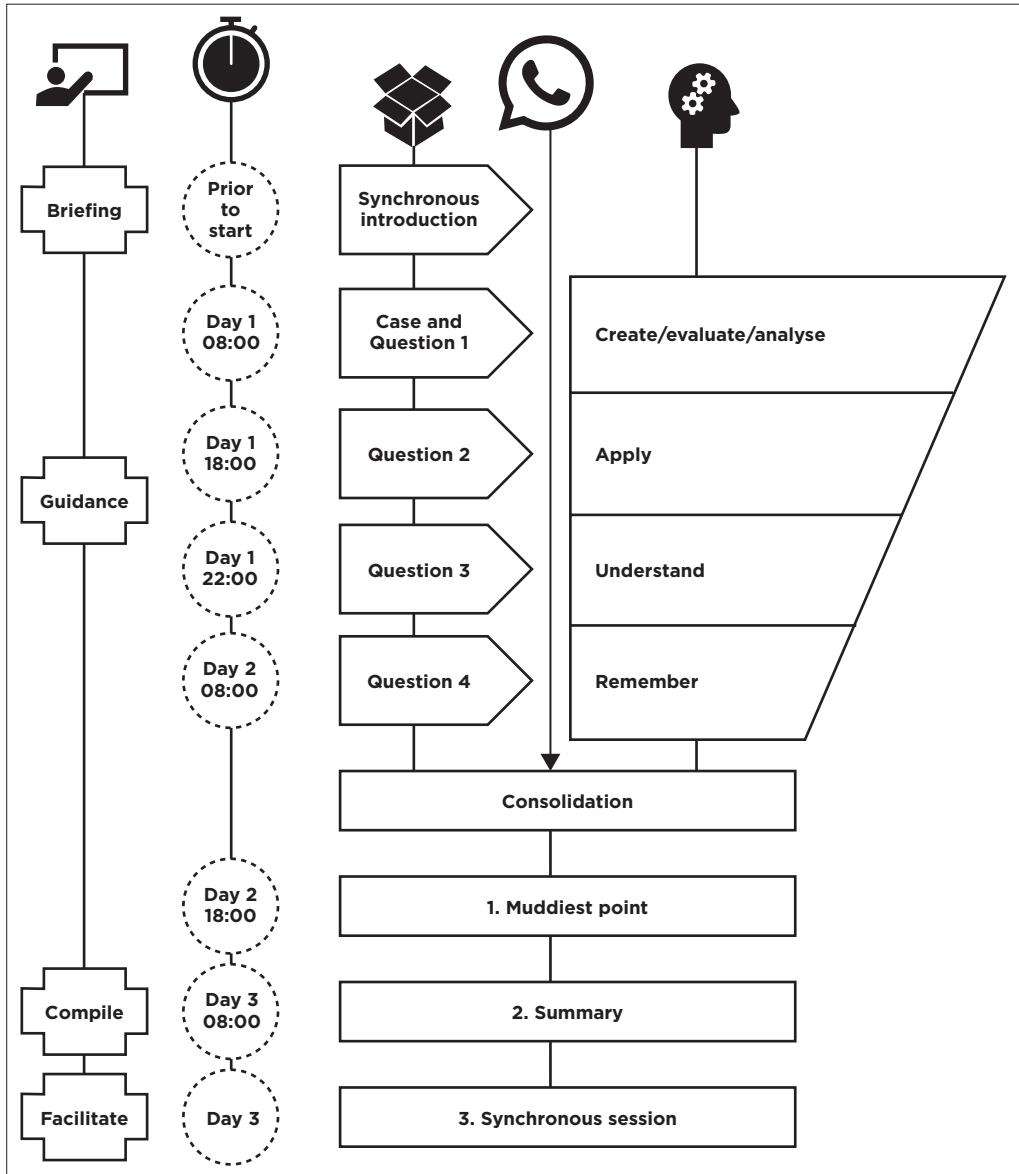
The students also made specific suggestions related to the content, facilitator input and engagement, as well as logistics. Although students gained knowledge from the fictional cases developed by the facilitators, they suggested that students actively participate in identifying potential cases they identified as challenging on the clinical platform. They also suggested more frequent facilitator engagement, such as validating the contribution or guiding the focus of the discussion. Face-to-face contact to discuss difficult concepts was also suggested, especially after the summary was provided at

the end of the discussion. This contact could provide the opportunity for questions to be asked, which they felt was not available during the case discussion.

Suggestions made were predominantly related to the logistics of the case discussion group. Students suggested that careful consideration of their workload and the demands of the specific clinical rotation be considered when planning the case discussion groups. They preferred that case discussions not take place on Fridays and not run longer than 48 hours, with a preference for completion within a 24-hour period. A few students commented on the accessibility and convenience of contributing whenever they could, including evenings. The linear format afforded by WhatsApp was a concern, especially with a larger group when many contributions had to be navigated through. Some students suggested posting all the questions at the start of the discussion, like the recommendation by Indu et al. (2018) of a more uniform manner of posting questions (i.e. at the same time each day) to reduce the number of times students had to consult the platform. This would, however, defeat the purpose of using the inverted Bloom's taxonomy and reasoning through the complexity of the questions. The linear format also resulted in responses not being grouped together, as students would respond to more than one question at a specific point. In response to this, students suggested introducing a cut-off time for responding to specific questions, thus allowing responses to be grouped together. There were varied views on this suggested timeframe. This could be because questions were posted while students were still busy on the clinical platform and had varied workloads. Structuring the four questions around the clinical practicum instead of the set six-hourly posting could be a means to address this concern.

Using the students' perceptions of the case-based, peer learning and their suggestions, adjustments were made to the framework, as seen in Figure 3.3. The framework will be based on a seven-week clinical neurology rotation to demonstrate how the suggestions have been incorporated. Case discussions will be scheduled fortnightly in Weeks 2, 4 and 6 of the rotation. This would allow students to settle into their clinical rotation without the added workload of a case discussion. A case discussion is also not scheduled in the final week of the rotation as their focus would be their final assessments and clinical administration. The results highlighted the need for a short synchronous meeting to orientate the students to the format and expectations for the case that would run for the next 24 hours. Topics to be included are the basics of mobile learning, the case discussion process and reminding students that the WhatsApp platform does not offer anonymity.

WhatsApp is the chosen preferred platform as it is inherently socially based. Students need to understand that even though they are not anonymous, the aim is to create a safe space for peer learning. They will be encouraged to engage and have an open mind to contributions to allow everyone the space



**FIGURE 3.3:** Revised framework of case-based, peer learning programme when using WhatsApp as a learning tool.

to participate without hesitation (Indu et al. 2018). Peer and social learning will indirectly encourage self-directed learning and the development of problem-solving skills that are needed on the clinical platform. Additional points to be highlighted in the briefing session are that students should be encouraged to ask questions and make use of the varied formats to contribute (e.g. voice notes, emojis and GIFs). Both points could encourage social interaction between the students, which is the basis of peer learning.

Facilitators should continue incorporating the principles of case-based learning when developing new cases to ensure that theory is linked to practice using authentic clinical cases (Thistlewaite et al. 2012). The facilitators will select the cases for Week 2 and Week 4, based on the students' clinical experience and clinical challenges observed. The case or diagnosis used during Week 6 will be suggested by the students. They will have to discuss and agree on a case or diagnosis and inform the facilitator during Week 3 to afford enough time for the development of the case content. Students would thus actively be included in directing the learning experience to meet their specific clinical needs.

Although the students also commented on the timing of the posting of questions, no consensus was reached based on both the qualitative and quantitative results. Most students preferred that a case discussion be conducted between 24 and 36 hours, with consideration of their workload and clinical responsibilities. After the briefing on the first day of the case discussion, the case scenario and first question will be posted at around 08:00 in the morning. Question 1 will include Bloom's taxonomy level of 'Create or Evaluate'. This will allow them to read the case and the first question, and they will therefore be aware of the focus of the case and the initial question. They can respond any time before the second question is posted at 18:00 in the evening. Question 2 will include Bloom's taxonomy level of 'Analysis'. Question 3 will be posted at 22:00; although this is quite late and will influence their personal time, it is required to accommodate the shorter suggested completion time. The focus of question three is the 'Application' level of Bloom's taxonomy. The final question will be posted at 08:00 on the second day and contributions will be allowed until 18:00 on the same day. Question 4 will include the most basic level of Bloom's taxonomy of 'Understanding and Remembering'. The case discussion will thus be completed within a 24-36-hour cycle.

Students will also be encouraged to submit their muddiest points from the specific case at 18:00. The use of this classroom assessment technique will encourage students to evaluate the case content in a self-reflective manner, thus requiring their active participation in their learning through the submission of questions and will also provide the facilitator with feedback regarding the learning process (Aycock, Sikes & Stevens 2018). Including this in the framework ensures awareness of learning and knowledge gaps and encourages self-directed learning. The muddiest point technique will also allow facilitators to identify concerns or difficulties and guide their preparation for the face-to-face discussion. The summary of the contributions and responses, as well as additional learning material, will be provided to the students at 08:00 on Day 3. The summary can be used as a resource on the clinical platform. The face-to-face or online meeting will be held on Day 3. As students will be on the same clinical platform, the meeting could be conducted at the clinical site. The meeting will also allow facilitators to address the questions that arose in

**BOX 3.1:** Recommendations for practice.

Ensure that space is created on the clinical rosters, specifically for engagement in the WhatsApp case discussions.

Include structured opportunities for reflection and consolidation of learning through utilising the muddiest point strategy.

Integrate face-to-face sessions into the programme to encourage active engagement and question-and-answer opportunities.

Emphasise the importance of the development of resources during the case discussion process to bridge the gap between theory and clinical practice.

Develop and include cases specific to the clinical platform being engaged in.

the muddiest point exercise. Responding to these questions and any other questions in the meeting will allow for the engagement to be student-driven. Active student participation is a requirement to ensure the bridge between theory and clinical application. The muddiest points can be used to engage students and align the synchronous discussion with peer learning principles.

A new element that has been added to the framework is the greater focus on the facilitator's role. It is suggested that the facilitator continues to provide guidance rather than a leading role, to not encroach on the inherent principles of social constructivism approach and peer learning fundamental to the case discussions. The facilitator can respond to all direct questions and is also allowed to post one guiding message per question. This guiding contribution could include a short summary of what has been discussed and then guiding into another aspect of the question. The suggestions would be that possible guiding messages be constructed for each case. The elements based on suggestions and perceptions of students were incorporated into the framework, as seen in Figure 3.3. Specific recommendations for practice drawn from the framework are outlined in Box 3.1.

## ■ Limitations and recommendations for future research

The small sample size was a limitation of the study as only a portion of the fourth-year class was included because of their clinical placement at the time of data collection. It is recommended that further investigation be conducted to evaluate implementation in terms of effectiveness, quality of implementation and acceptability of the framework. It is further recommended that it be implemented across clinical years and platforms.

The facilitators' view on the framework was not included. This could be the focus of future research to develop an understanding of their perspective of their role and experience of implementing it on the clinical platform.

## ■ Conclusion

The findings of this study suggest a feasible way to bridge the gap between theory and practice in the South African context by utilising case-based learning in a mobile format to encourage peer learning. The combination of these learning strategies supports a social constructivist paradigm, which allows for learning in a clinical context through peer engagement. The WhatsApp platform offered an effortless solution to introduce mobile learning; although it had limitations, it afforded students flexibility and accessibility within a context with limited resources. Encouraging peer learning established a problem-solving approach to case-based learning to be carried over to the clinical platform. A need was identified to expand the role of the facilitator to include some elements of active teaching and learning in the framework to help students consolidate more challenging concepts.

# Effect of video portfolios on learning foundational (physiotherapy) techniques

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## ■ Abstract

**Background:** Physiotherapy students must perform more than 200 techniques but often struggle to meet the minimum standards. Emerging technologies enabled the exploration of an e-portfolio of self-recordings and peer assessment to overcome the challenges of conventional approaches. Submitting self-recorded videos of techniques encourages experiential

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learning and, when supported by peer assessment, provides students with opportunities to view their own performance, promoting the development of self-regulated learning.

**Aim:** This study aims to determine the effect of a peer-assessed video portfolio on attaining physiotherapy technique competence.

**Methods:** A descriptive correlational study design was used. All second-year students ( $n = 67$ ), after submitting 23 self-recorded videos, were invited to complete a self-perception questionnaire. Repeated-measures analysis of variance compared the performance across four objective structured practical examinations (OSPEs), and Pearson's correlation coefficient compared the mean final marks of the video portfolio and OSPE. Interclass correlation coefficients explored the reliability by comparing peer scores with lecturer scores.

**Findings:** Responses from 63.6% of participants suggested that the intervention made them practise more (87.2%), helped them do better in the OSPE (77.5%) and made them reflect on their own performance (71.8%). Performance across the four OSPEs varied throughout the year ( $p = 0.021$ ). The mean final marks of the e-portfolio and OSPE were almost identical ( $p = 0.96$ ). The reliability of peer assessment compared to lecturers was moderate (intra-class correlation coefficient [ICC] = 0.616) but improved (ICC = 0.938) when benchmark videos were provided prior to peer assessment.

**Conclusion:** Learning new techniques using self-recording and peer assessment is a strategy valued by students, which helped them to practise more and resulted in more students meeting the minimum standard. Further investigation into the predictive validity of e-portfolio is recommended to consider this as an alternative assessment to the OSPE.

## ■ Introduction

Students in physiotherapy must learn to effectively perform multiple evaluations and treatment techniques needed for successful clinical practice, and lecturers are accountable for ensuring that students achieve the minimum standard before they enter the clinical platform and apply these techniques to patients. Most of these techniques are first learnt in the foundation years. In Stellenbosch University's physiotherapy programme, we use the objective structured practical exam format, also known as the objective structured practical examination (OSPE), to assess competence at Miller's level of 'show me how' (Cruess, Cruess & Steinert 2016). Faculty experience suggests, however, that students are struggling to meet the minimum standard. Additionally, there is evidence that the OSPE format, despite being largely considered a valid and reliable measure of practical skill proficiency (Barman 2005; Besar et al. 2012; Brannick, Erol-Korkmaz & Prewett 2011), is perceived

to be decidedly stressful for students and faculty (Ferreira et al. 2020) and does not adequately assess proficiency or predict performance in the clinical setting (Muldoon, Biesty & Smith 2014; Pierre et al. 2004; Wessel et al. 2003). Our students and faculty concur that the OSPE is stressful and artificial and lacks generalisability.

Ineffective or insufficient preparation by students contributes to the stressful nature of the OSPE assessment. In our context at Stellenbosch University, students are taught the principles of application of patient evaluation and treatment techniques in the classroom by the lecturers utilising a five-step instructional approach (George & Doto 2001). Students, however, are expected to be able to apply these techniques to different body structures and systems, which often require adaptations in how patients are positioned, hand grasps and instruction to the patient/model. The students' timetables, however, do not allow for practice across the many different body structures or systems. Furthermore, large student numbers in the classroom make it difficult for lecturers to provide immediate individual feedback to students. From student feedback, it is evident that practice time is perceived to be a waste of time. Lecturers, in turn, report that students seem to lack motivation and self-discipline, which are key factors for learning and developing competence (Kusurkar 2012) and do not optimise classroom hours to practise newly acquired techniques. It is also our perception that students have adopted a more passive approach to learning techniques by talking through and observing instead of doing and are hesitant to engage in small groups and rely on peers for feedback. There is a need for an alternative strategy to encourage students to practise techniques more consistently to ensure they reach satisfactory levels of competence before entering the clinical platform.

## ■ Video portfolio

To address concerns of resource and curriculum constraints that limit opportunities for supervision and feedback of student practice, a physiotherapy programme in New Zealand required students to submit self-recording of selected clinical skills (Maloney et al. 2013). Students participating in this study also had to complete a reflective task on each video submission after receiving online tutor feedback and viewing an exemplar peer performance. This method showed to be more effective for developing clinical skills competence than instructional teaching, which is traditionally the mode of instruction also used in our context. The authors also reported that this afforded students an opportunity to reflect on their own performance against peer benchmarks and assisted with the development of self-regulation (Maloney et al. 2013), a critical skill to help students become comfortable with and dealing with 'not knowing' (Bleakley & Bligh 2008, p. 103). This is a necessary skill our students need to develop during their training for effective

practice in a fluid and changing health care context. Local research by colleagues in occupational therapy has reported that e-assessment (video submissions) can contribute to clinical skills acquisition (Cloete, Jacobs-Nzuzi Khuabi & Van Niekerk 2018). They implemented the e-OSPE following a reduction in their divisional budget. Further review of the literature shows that e-portfolios are increasingly used in health professions education locally and abroad to evidence experience and competence (Bramley et al. 2021; Haldane 2014; Haverkamp & Vogt 2015; Jenkins, Mash & Derese 2013). Producing a portfolio requires synthesis of ideas, reflection on achievement, self-awareness and forward planning (Park et al. 2004; Yancey & Hunt 2009), all affordances that could motivate students to dedicate more time to practising newly acquired techniques.

There is value in learning skills development if effective, timely feedback is provided on an individual level to students (Abraham & Singaram 2016). Given the challenge of increased student numbers and decreased opportunities for individual feedback during class, we developed an adapted version of an 'e-portfolio' to address our concerns related to perceived passive and inconsistent practising. Every week students were given a new task instruction (new technique). They were required to work in small groups in their own time after class, practise the technique and then individually record and submit a video clip of themselves executing the prescribed technique to the university's learning management system (Moodle). This was immediately followed by an assessment of one of their peers against a rubric, which was thought would stimulate the reflection of own performance to enhance the learning experience (Topping 2017; Tricio, Woolford & Escudier 2016). Moodle's 'workshop' activity was used, which enabled lecturers to upload a rubric for students to use for self- and peer assessment. Allocation for peer assessment was random (automated) for each week's submission ensuring all students received feedback from multiple (peer) assessors, increasing the validity of the portfolio for assessment (Besar et al. 2012; Turner & Dankoski 2008). Peer assessment was lecturer moderated by randomly selecting peer-assessed submissions throughout the year. The e-portfolio commenced in the second term of the academic year and allowed for 24 video (technique) submissions.

Competence continued to be assessed using the OSPE format. Themes (stations) selected for the OSPE assessment are aligned to the weighting of the themes in the module in which these techniques are learnt. For each station, the final technique selected is determined by the lecturer who taught the technique(s). It is relevant to note that the inclusion of a technique that was also practised and submitted to their portfolio prior to the assessment was not guaranteed. This ensured that students practised all techniques and not just those submitted to their portfolio. The portfolio contributed 8% to the final mark for the module as a strategy to encourage student participation. As this was a novel intervention, we also experimented with different task

instructions for the video submission and the peer assessment, and without evidence that peer assessment is reliable within this context, for each student one technique was randomly selected and marked by a lecturer. Therefore, 60% of the student's final mark for the portfolio comprised the average mark awarded by their peers across the 24 techniques, and the other 40% comprised the mark of the randomly selected technique awarded by the lecturer.

The *primary aim* of this study was to explore student satisfaction with this additional opportunity to improve their skills and to determine the effect of this peer-assessed video portfolio on the attainment of foundation technique competence in our undergraduate physiotherapy students. The *specific objectives* were to determine:

- whether students practised skills learnt in class more often
- students' perceptions and levels of satisfaction concerning this format of learning
- students' perceptions and levels of satisfaction concerning the peer assessment process
- whether changes in instructions for task submission and assessment affected their learning.

The *secondary objectives* were to correlate portfolio performance with OSPE performance and determine the reliability of peer assessment.

## ■ Methods

### ■ Study design

A descriptive correlational study design was used to explore student perceptions and levels of satisfaction towards the video portfolio initiative. Student perception of the portfolio format for learning and assessment of foundational physiotherapy techniques was also investigated. A comparison between portfolio marks and final OSPE marks was used to explore the effectiveness of the intervention. Given that peer assessment was a novel approach in our context, the reliability of peer assessment was also probed.

### ■ Sampling

Purposive sampling was used in this study. All second-year students ( $n = 66$ ) in the physiotherapy programme at Stellenbosch University (SUN) were eligible to participate as they all submitted most of the 24 technique videos and thus were suited to provide adequate insights concerning the effectiveness of the initiative. The response rate in feedback questionnaires and surveys in health science education is poor (Phillips et al. 2017), and thus, all students were invited to complete the self-perception questionnaire.

For the reliability study, a sample size calculation (Statistica 11) revealed that a sample of seventeen student-lecturer pairs was required to detect an expected correlation of  $r = 0.7$ , with a probability of 0.05 and a power value of 90%. However, because we experimented with different instructions for video submissions and peer assessment, all lecturer-to-peer mark pairs were included in the analysis.

## ■ Instrumentation

A self-compiled questionnaire asked participants to describe their perceptions and levels of satisfaction related to the video portfolio format of learning and assessment. A literature review and the standard Stellenbosch University feedback form used for lecturer and module feedback informed the development of the questionnaire used in this study. It consisted of three sections. Section 1 collated information on student demographics, including age and gender, and whether students repeated the year or not. In Section 2, students could rate their perceptions and their levels of satisfaction concerning the format of learning and assessment using a Likert scale ranging from strongly agree to strongly disagree. Section 3 allowed for seven open-ended questions that probed Section 2 responses, including what they liked the most and least, barriers to participation and any suggestions for improving the video portfolio and peer assessment processes. Students were also asked whether they could manage more techniques per week and were posed the question of whether they thought the video portfolio and peer assessment should be considered a valid replacement for the current OSPE format. A pilot trial among senior students helped clarify certain statements and determine the time it would take to complete the questionnaire. Some adjustments were made to shorten the questionnaire, and grammatical or spelling errors were corrected. The final version was formulated using REDCap and made available to participating students.

## ■ Procedure

Following approval by the Stellenbosch University's Health Research Ethics Committee (N18/09/093) and obtaining consent from the Stellenbosch University's Division of Institutional Research and Planning, students were informed of the purpose and scope of the study during class time and were invited to participate. They were informed that their participation would be voluntary and that answering truthfully posed no risk to their future studies. The feedback obtained by participating in this study would be used to improve or inform future interventions or assessment strategies. They were emailed a link to the online questionnaire, which they could anonymously complete in their own time. The questionnaire was available for two months. Reminders were sent out twice during this period. All data collected were treated confidentially and stored on a laptop in a password-protected folder.

## ■ Data management and analysis

All responses to the REDCap questionnaire were downloaded onto an Excel spreadsheet and analysed using Statistica (version 13). As themes were predetermined and related to the research objectives, the frequency of rated responses to each of the questions was calculated. Additional information was sought through open-ended questions where students were asked to elaborate on the previous statement(s). Quotes related to the predetermined theme were identified by the research team and are reported verbatim.

Analysis of variance was used to compare marks across the four OSPEs to explore the impact of video portfolio participation on the remaining three OSPE marks across the year. Pearson's correlation was used to compare final OSPE marks with video portfolio marks. This intervention was compulsory for all second-year students enrolled in the physiotherapy science module ( $n = 66$ ), and because participation in this study was anonymous, it was not possible to explore whether study participant results may have differed from those that did not complete the questionnaire, and all their marks were used to compare video portfolio marks with final OSPE marks. The intra-class correlation coefficient (ICC agreement) was the preferred means to determine the reliability of peer assessment as it also indicates if a consistent difference exists between student and faculty marks, should there be a difference in marks between the two groups. The level of significance was set at  $p < 0.05$ .

## ■ Results

The response rate for the self-administered questionnaire was fair, with 45 out of 66 students accessing the questionnaire. Data from three participants were more than 75% incomplete and therefore removed from the analysis. Data from the remaining students ( $n = 42$ ; 63.6%) were used in the final analysis. Five (12%) participants were male and 37 (88%) participants were female. This is in line with the class and Stellenbosch University's physiotherapy programme enrolment demographic. Most participants were aged between 19- and 21-years-old (52.4%), sixteen participants were aged between 22- and 24-years-old (38.1%), two participants were aged between 24- and 26-years-old (4.8%) and one participant was older than 26-years-old. There was also only one younger participant who was 18-years-old.

### ■ Student perception and level of satisfaction with the e-portfolio

#### □ Did students practise more?

Our primary motivation for embarking on an e-portfolio was to get students to practise techniques more, and from the responses in Table 4.1, the intervention seemed successful, with 87.2% of respondents ( $n = 34$ ) acknowledging this by agreeing or strongly agreeing.

**TABLE 4.1:** Students' responses to the value of the e-video portfolios.

The video portfolio ...	<i>n</i>	Strongly agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly disagree (%)
... made me practise techniques I learnt in class	39	43.6	43.6	5.1	7.7	0
... was useful and helped me do better	40	27.5	50	17.5	2.5	2.5
... made me reflect on my own performance	39	15.4	56.4	20.5	5.1	2.6
... increased my performance the more videos I completed	39	15.4	53.8	20.5	7.7	2.6
... helped build my confidence	39	10.3	59	23.1	5.1	2.6

Key: *n*, number of students that responded to each statement.

## □ Did the portfolio help students learn techniques?

Most of the students ( $n = 31$ ; 77.5%) thought that the video portfolio was useful and helped them perform better in the OSPE (Table 4.1). Also evident from Table 4.1 is that ( $n = 27$ ; 69.2%) students reported that their performance improved the more videos they completed.

## □ Students' perceptions of the assessment process

Most of the participants also agreed (62.2%;  $n = 23$ ) that they were satisfied with their peers' scores of their performance and agreed that they were consistently fair (62.2%;  $n = 23$ ) (Table 4.2). However, the majority (66.7%;  $n = 24$ ) indicated that their peers did not give them constructive criticism. Students did, however, report that they enjoyed marking their peers (78.4%;  $n = 29$ ).

Students were, however, more neutral (55%;  $n = 22$ ) concerning their level of enjoyment with practising, recording and submitting evidence of their own performance (Table 4.2).

The open-ended question that received the most responses ( $n = 35$ ) pertained to whether the rubric at the onset of the task was essential or not. As can be seen in Table 4.2, most students (77%;  $n = 30$ ) were in favour of a rubric to help guide their performance, and this was supported by their open-ended responses.

Students liked knowing exactly what was expected of them, and the rubric provided a systematic method to practise:

- '[...] there are some technicalities that students wouldn't know unless they see a rubric.' (Participant, student, exact date unspecified)
- '[...] so that I can do it correctly' and we know what markers expect of us.' (Participant, student, exact date unspecified)
- 'I understood better when one (rubric) was provided and provided direction [...].' (Participant, student, exact date unspecified)
- '[...] easy to fail if you don't have the right rubric.' (Participant, student, exact date unspecified)
- 'Without a rubric, it is difficult to get all the marks.' (Participant, student, exact date unspecified)



**Table 4.2:** Student responses concerning the video portfolio.

Questionnaire item	<i>n</i>	Strongly agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly disagree (%)
I enjoyed practising, recording and submitting evidence of my performance	40	5	22.5	55	10	7.5
I thought my peers' assessments were consistently fair	37	2.7	62.2	32.4	2.7	0
I preferred not to be given a rubric	39	5.1	2.6	15.4	46.2	30.8

Key: *n*, number of students that responded to each statement.

The responses also indicated that many students favouring a rubric before practising are *marks-driven* and did not always demonstrate an appreciation of their learning. Some students also commented that, at times, there were several rubrics available (obtained through other means) that were different and confused them. This further supported why some students thought it essential to have the rubric used to assess them upfront.

Students who thought the rubric was not essential seemed to recognise the benefit of learning by not having a 'recipe':

- 'I use the rubric only after I have practised to check to see if I have done something wrong or forgotten something.' (Participant, student, exact date unspecified)
- 'When you have the rubric, you just do what it says and don't focus on figuring it out for yourself.' (Participant, student, exact date unspecified)
- 'Working it out for myself made it easier to apply the technique to other muscles and or joints.' (Participant, student, exact date unspecified)

## □ What students liked the most

Many of the responses to this question supported the outcome that students valued the intervention in support of their own learning reported in Table 4.1:

- 'I enjoyed seeing where I went wrong and where I could improve on my own technique.' (Participant, student, exact date unspecified)
- 'I liked learning about different ways/approaches to techniques that could compliment my own when I would next perform it.' (Participant, student, exact date unspecified)
- 'Showed me how to improve my own technique but also sometimes made me aware of common mistakes made.' (Participant, student, exact date unspecified)
- 'I got exposure to how other people interpret the techniques, and therefore I had a chance to reflect on my performance of the techniques.' (Participant, student, exact date unspecified)
- 'It forced me to keep up with my theoretical work and practical skills and kept me practising these skills every week. I needed this kind of motivation.' (Participant, student, exact date unspecified)



- 'We could rewatch the videos we recorded before the OSPE.' (Participant, student, exact date unspecified)
- 'It made practising for OSPE much easier. The work was also easier to understand. It basically forced us to work through techniques which is a good thing.' (Participant, student, exact date unspecified)

## □ What students liked the least

Most of the responses to this question referred to the process of peer assessment and included statements such as:

- 'I do not think we know the best about each technique, so one of our lecturers would be more equipped to give constructive feedback.' (Participant, student, exact date unspecified)
- 'Not enough or useful feedback.' (Participant, student, exact date unspecified)

Language was a barrier for some participants. Stellenbosch University is a dual medium higher educational institution, and students may submit assessments in either English or Afrikaans:

- 'Marking video that was done in Afrikaans was not working for me at all. Even though I understand a bit of Afrikaans it would have been convenient for an English video to be assigned to me.' (Participant, student, exact date unspecified)

A few participants also experienced technological and logistical issues:

- 'With the video FUSPEs (*Fisioterapie Universiteit Stellenbosch praktiese eksamens*) (OSPEs) you really need to plan well on when you will be recording and finding classmates/friends to record and be your model. Also, to find a space to record becomes a problem from a Wednesday on, especially when we did not receive the technique for the week on time. Everyone then tries to film their FUSPE (OSPE) and then there is a struggle of waiting for each other so you can hear yourself on your video or having a lot of background noise that can sometimes overpower your voice and then struggling at times to hear what the student is saying.' (Participant, student, exact date unspecified)
- 'Initially, the technological admin was very confusing – a better info session on this is needed and I really disliked not getting feedback and marks directly after my videos.' (Participant, student, exact date unspecified)

For some participants, time constraints impaired the ability to perform:

- 'Sometimes the filming of these videos would be conflicting with other tests and exams, and although it kept me practising and honing my practical skills, I had to neglect some of my studying time (time constraints).' (Participant, student, exact date unspecified)

- ‘Exams and tests would be piling up and recording a video added to the stress.’ (Participant, student, exact date unspecified)
- ‘It took up quite a bit of time to take three different videos for classmates as you had to work in groups of three and then upload the videos.’ (Participant, student, exact date unspecified)

## ■ Effect of the video portfolio on objective structured practical examination scores

There were four OSPEs, of which three took place after the video portfolio intervention commenced. Marks differed significantly across the four assessments ( $p = 0.021$ ), which was because of the poor and more variable performance in the third OSPE (Table 4.3). While OSPEs one and two included only new techniques learnt, the third OSPE included techniques learnt since the beginning of the year, which may attribute to the subsequent lower mark seen. Students had more than double the number of techniques to practise in preparation for this OSPE.

Students performed significantly better again in the fourth OSPE despite it including techniques learnt across the year and techniques learnt in their first year. There was no significant difference in group mean marks from OSPE 1 to 4.

Only one technique submitted to their portfolios was also included in the OSPE and that occurred in the fourth OSPE assessment. The class mean mark for that one technique was significantly better than the average mean of the other five techniques ( $p < 0.01$ ) also included in the fourth and final assessment opportunity.

As can be seen in Table 4.4 and contrary to our assumption, the final mean mark for the e-portfolio was almost the same as the mean final OSPE scores ( $p = 0.96$ ). It can, however, be questioned whether the final OSPE marks would have been the same without the video portfolio intervention.

**TABLE 4.3:** Mean marks across the four objective structured practical examinations.

OSPE	Mean	95% CI	<i>p</i>
1	79.42	77.8; 81.04	0.021
2	79.291	77.42; 81.16	
3	72.97	68.98; 75.01	
4	80.51	78.98; 82.04	

Key: OSPE, objective structured practical examination.

Note: Video portfolio intervention commenced in the second semester, that is, after OSPE 1 as indicated by the shaded area.

**TABLE 4.4:** Objective structured practical examination scores versus portfolio scores ( $n = 66$ ).

Scope score	Mean $\pm$ SD	<i>p</i>
Final OSPE score (%)	78.41 $\pm$ 19.85	0.96
Portfolio score (%)	75.81 $\pm$ 10.77	

Key: OSPE, objective structured practical examination.

## ■ Reliability of peer assessment

Sixty-five percent of students rated peer assessment as consistently fair (Table 4.1). However, the reliability of peer assessment compared to faculty was initially moderate, with an ICC of 0.616, but this improved significantly (ICC = 0.938) (Figure 4.1) when a benchmark video was provided prior to peer assessment (i.e. students were tasked with first viewing a video demonstrating correct execution before assessing their peer) (refer to video portfolio).

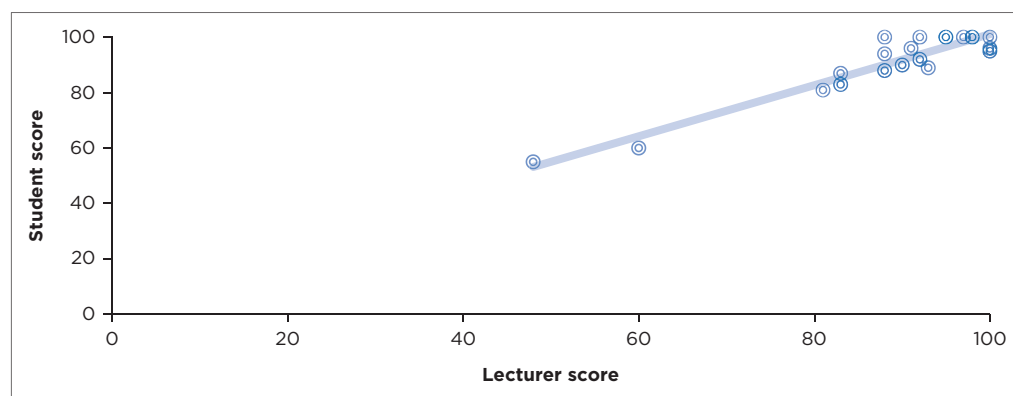
## ■ Suggestions from respondents for improvement

Students were also asked to make suggestions for improving the intervention. Most of the responses to this question pertained to how their final mark for the module was determined and felt given the workload should have counted more than the 8%:

- 'It's a lot of work for a small percentage to your total. I would suggest giving less FUSPEs (OSPEs) or making it count more.' (Participant, student, exact date unspecified)

The timing of the release of feedback was also cited as an area of improvement. Initially, because of lecturer moderation, the release of feedback did not always happen timeously:

- 'There needs to be consistency regarding the provision of rubrics and feedback and marks must be given throughout the year to allow us to use the feedback to improve.' (Participant, student, exact date unspecified)
- 'Not everyone could review their marks per video and see the comments left behind which affected the usefulness.' (Participant, student, exact date unspecified)



**FIGURE 4.1:** Lecturer score and student score displayed as percentages (0%-100%) after the benchmark video was provided.

Other suggestions included making all the task instructions available at the start of the year for students to practise and submit the task when they had time available. Others agreed that if it was to replace the current OSPE, more tasks should be given, but then time on the timetable should be allocated for it:

- ‘If this system was to be used as an exam. More techniques need to be given. And then if possible a hour or two a week where students can record the techniques.’ (Participant, student, exact date unspecified)

### □ **Should the video portfolio replace the objective structured practical examinations?**

Thirty-two of the 42 participants responded to this question, with only eight agreeing that the video portfolio should replace the OSPE as a mode of assessment of technique competence. It is evident that students recognise the need to practise ‘being under pressure’:

- ‘Students need to be put under pressure to perform as they will not be doing techniques on their friends but in a professional situation.’ (Participant, student, exact date unspecified)
- ‘FUSPE (OSPE) prepares you for more real-life experiences. You get a patient and you have to help them, you don’t have a week to prepare.’ (Participant, student, exact date unspecified)
- ‘With video FUSPEs (OSPE) you aren’t tested – you have the rubric with you and can shoot the video as many times as you like to get it perfect.’ (Participant, student, exact date unspecified)

Those who felt that the video portfolio is an appropriate replacement noted it as a truer reflection of their abilities, that it would be a lot less stressful and that it would allow a wider scope of techniques to be assessed:

- ‘FUSPEs (OSPEs) are not a true reflection of how well you know your techniques. It only addresses your competency to perform the technique in front of an examiner that won’t mark you as your supervisor and performed on someone who is not a patient.’ (Participant, student, exact date unspecified)
- ‘FUSPE (OSPE) setting is very stressful. More learning takes place when recording videos. Video could also be watched over again.’ (Participant, student, exact date unspecified)
- ‘[...] you have more times to try and get your technique right.’ (Participant, student, exact date unspecified)
- ‘[...] you have the rubric with you and can shoot the video as many times as you like to get it perfect.’ (Participant, student, exact date unspecified)

## ■ **Discussion**

The results of this study suggest that a peer-assessed video portfolio in which students practise and record their performance of selected foundation

evaluation and treatment techniques is an effective strategy to address concerns related to inconsistent and insufficient practising resulting in students struggling to meet minimum standards of proficiency. For our students, the improved consistency in practice fostered by the intervention aided in self-reflection and perceived improvement in confidence and performance.

Developing confidence is aligned with recommendations for preparing students for high-stakes assessments in health professions education (Swan Sein, Dathatri & Bates 2021). Confidence helps to counter the systemic and personal impact high stakes may have on student experience and ability to perform on a clinical level. The findings of a study by Inayah and colleagues (2017) involving junior medical students demonstrated that, although not good predictors of high-stakes objective structured clinical assessment, self-assessment and peer assessment provide an important learning opportunity for techniques for clinical practice when they are used as part of continuous assessment (Inayah et al. 2017). This was true for our students in their reported experience of the intervention and agreement with the consistency of their peer assessors.

Although assessment is often used for gate-keeping purposes, the broader role of health professions education is to foster 'deep, self-directed, meaningful, motivated learning' (Swan Sein et al. 2021, p. 5). Similarly, in our environment, seeking assessment 'for' learning is preferred to assessment 'of' learning. Responses in our study, however, suggest that despite the non-threatening and lack of high stakes, this intervention did not distract students from their focus on marks versus that of their learning. The inclusion of the portfolio marks into their final marks of the module was perhaps a contributing factor. Besides self-recording and exposure to peer assessment, Maloney et al. (2013) also included a formal reflective component in which students had to reflect on their own performance against that of a peer benchmark video selected by a tutor. Getting students to also reflect on their own performance may *purposefully* assist in getting students to value assessment as critical to their development into self-motivated and lifelong learners.

This intervention also aimed to encourage students to reflect on their own performance, and although students reported that this did get them to reflect on their own performance, the impact thereof remains unknown. It is well described in the literature that getting students to reflect does not ensure self-regulated learning and requires dedicated training of students on how to reflect (Van der Gulden et al. 2020). This will be considered in future assessment practice.

## ■ Video portfolio versus objective structured practical examinations

The results of this study showed that assessment marks did not differ significantly between the final OSPE and video portfolio marks, and it is

therefore perhaps not surprising that many students did not feel that the video portfolio should replace the OSPE. It may be that the stress of completing the portfolio timeously was an addition to and not a replacement within the programme. It may also have been a contributing factor to the apparent indecision among students. Albeit untested, another reason for the reluctance to replace the OSPE with the video portfolio may be the time it takes to complete the video submissions and peer assessment. Some students in favour of keeping the OSPE reported that '[...] its quicker to do six stations in one day [...]' While students acknowledge that the portfolio was less stressful, having to perform 'under pressure' was also recognised by some students as appropriate and as a requirement for clinical practice. As reported earlier, it is likely students did not factor into their deliberations the impact participation in the video portfolio had on their OSPE marks, but without control, the impact remains unclear.

Although the OSPE is considered the gold standard for assessing clinical skills competence (Khan et al. 2013), it remains questionable whether performance under pressure is necessary when the expected outcome in foundation years is, according to Miller's pyramid, 'show me how' (Cruess et al. 2016) or, according to Dreyfus and Dreyfus model of skills acquisition (Dreyfus & Dreyfus 1986), at a 'competent' level. Proficiency or mastery level of performance is only evident in programme exit-level outcomes where the expectation is that senior students can perform these techniques on patients while being directly observed in the clinical setting. Students did recognise the need to perform under stress, but whether this 'training' when commenced in foundation years has an impact on high-stakes assessment in later years of study remains unclear.

Objective structured practical examinations in physiotherapy have been criticised for lacking predictability of performance across techniques and not being predictive of performance in the clinical setting (Wessel et al. 2003). The findings, albeit based on one technique also included in the portfolio that performed significantly better than the average of the other techniques included in the final OSPE, support Wessel et al. (2003) findings. It is recognised that the OSPE process may be a contributing factor to these findings. The number of stations, number and experience of the assessors and quality of the instruction and rubrics or mark sheets used may all have an impact (Barman 2005; Gerhard-Szep et al. 2016; Malau-Aduli et al. 2017; Shahzad, Saeed & Paiker 2017). Despite multiple efforts to improve the process in our context, it has done little to improve student performance or perception of the assessment within our setting. A further critique of the OSPE format is the cost, requiring multiple assessors for a lengthy period (Barman 2005; Gerhard-Szep et al. 2016), and it provides additional motivation to further explore the video portfolio as an alternative to the OSPE for ensuring 'show me how' level of competence at foundation level.

The current intervention allowed for only 24 submissions/techniques. Across the four OSPEs, students were examined on the same number but with different techniques, except for one station. Performance in that station was significantly better than the average of the other stations in that (the last) fourth OSPE. This suggests that the method of practising and self-recording may significantly impact performance in the OSPE and is worth considering as a method to help students better prepare for OSPEs. Alternatively, if video performance scores are equal to OSPE scores achieved 'under pressure', is the OSPE assessment really needed to ensure students have reached the expected minimum standard? This will need further exploration.

## ■ Barriers to successful completion of a video portfolio

Increased social drive and access to technologies enabled this innovative addition to support students in their learning and proficiency in the many techniques needed for successful practice. The assumption, however, that all students own a device for recording, can record high-quality videos and can format videos was incorrect. More than 20% of the respondents in this study reported they used a peer's device, usually a phone, to record their own performance and almost everyone recorded their videos on campus. Although not asked in the questionnaire, we assume the latter may be because of internet and data limitations, which is a commonly cited barrier to participation in literature (Kebritchi, Lipschuetz & Santiago 2017) but could also be that practising on peers was easier than practising on someone unfamiliar with the technique. This will need further exploration. Because of poor recording skills, students reported that it was often challenging to view everything they needed to see or hear to mark the peer fairly, which suggests that better training and task instruction is needed. The issues reported when the portfolio commenced concerning video size and formatting further support that all students should be trained in all aspects of task instruction.

As this intervention was implemented prior to the COVID-19 pandemic, our division benefitted from the established practice at a time when examiner-observed assessments were limited. More importantly, it has provided our students with an opportunity for learning and clinical skill development in the absence of face-to-face classes. This has further supported the drive by the authors to foster a sustainable, reliable and valid assessment practice using a peer-assessed video portfolio.

## ■ Limitations

The generalisability of this study is limited to our setting and reports on the data of one student cohort only, but sharing our experiences with the

**BOX 4.1:** Recommendations for practice.

A video portfolio in which students practise and self-record foundational practical techniques in their own time followed by peer assessment is effective in helping students prepare better for higher-stakes summative assessment.

Peer assessment is reliable and significantly improves when a rubric is provided.

Adding written reflection on peers and lecturers' feedback to this video portfolio initiative may result in improved performance in the clinical setting.

Whether this video portfolio can replace or minimise OSPEs in the assessment strategy in foundational years to reduce assessment cost should be explored.

Key: OSPE, objective structured practical examination.

development of an e-based video portfolio that is peer-assessed might contribute to a shift in thinking around the use of the controversial OSPE for the assessment of foundational techniques in physiotherapy.

The focus of peer assessment studies is often on the student's perspective and performance (Adachi, Hong-Meng Tai & Dawson 2018). In our context, we have, however, recognised that the lecturer's perspective is essential for the continued practice initiated through this intervention. While the statistical comparison of peer and examiner assessment initiates lecturer engagement, it is recommended that further research be conducted to ensure lecturers' acceptance and adoption of the video portfolio going forward.

The current intervention only allowed for 24 video submissions of a possible 200+ techniques. Exploration into expanding the portfolio to include more techniques to ensure assessment across all fields of physiotherapy practice will also improve content validity (Swan Sein et al. 2021).

## ■ Recommendations

Box 4.1 outlines the recommendations for practice.

## ■ Conclusion

The results of this study support the use of a portfolio of self-recorded and peer-assessed physiotherapy technique performance. Students valued the intervention, which they reported got them to practise more, despite no apparent increase in this cohort's mean OSPE scores. It is hypothesised that adding explicit reflection on peer and lecturer feedback may improve the predictability of performance in the clinical setting. It is envisaged that successful completion of the e-portfolio scored by peers will form part of the criteria for passing these modules in the future. The results of this study support further exploration of the possibility of replacing or minimising OSPEs in the assessment strategy in the first- and second-year physiotherapy modules.





# Development and integration of telerehabilitation into service delivery and clinical training: A South African case study

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## ■ Abstract

**Background:** The impact of the coronavirus disease of 2019 (COVID-19) on the health system led to many challenges to the clinical training of health sciences, including rehabilitation students in South Africa. Educational stakeholders were compelled to be adaptable and unlock and develop alternative COVID-19 safe and innovative clinical training methods during and beyond the pandemic. The Department of Health and Rehabilitation Sciences, Stellenbosch University (SUN), Stellenbosch, South Africa, considered telerehabilitation as a new method of clinical training for senior rehabilitation students.

**Aim:** The aim of this study was to focus on an interdisciplinary collaborative, co-development process to integrate telerehabilitation into the clinical training of Stellenbosch University undergraduate rehabilitation students on the clinical training platform during the COVID-19 pandemic.

**Methods:** In this chapter, we describe the method and steps that were followed to ascertain if and how telerehabilitation could be introduced on the clinical platform for students, supported by clinical staff and educators. We established a telerehabilitation coordinating team to manage the initiative. We conducted a rapid narrative review to determine the key considerations of core knowledge and skills needed for a successful implementation of telerehabilitation. Simultaneously, we consulted national and international experts for guidance on how they approached the integration of telerehabilitation into clinical training as well as key contextual considerations linked to their local setting.

**Findings:** The rapid narrative review and expert consultations guided the proposed model for the integration of telerehabilitation services through the

development of a contextual training module, readiness assessment, establishment of a designated facility/hub and use of a hybrid model and a phased approach for the implementation of telerehabilitation on clinical sites through pilot studies.

**Conclusion:** We recommend the integration of telerehabilitation into clinical training. However, experts' opinions on key core knowledge and skills needed and the local contextual factors that might influence its adoption and implementation should be considered during the training. Approaching telerehabilitation training and integration in this way would provide guidelines for contextually relevant and sustainable telerehabilitation services across all clinical platforms.

## ■ Introduction







The disruption caused by COVID-19 led many to anticipate difficulties in student clinical training, as this is traditionally based on stable local health systems and service delivery models (Almeida et al. 2020). Potential challenges for clinical training included inaccessibility of clinical training sites, student exposure to COVID-19 infection, reduced availability of clinical supervisors and changes in services at all levels of care. Rehabilitation training programmes were suddenly faced with these challenges, while universities continued to apply pressure on staff to ensure students graduated on time. Students were displaced from health care and rehabilitation environments, and much of their clinical training shifted to online learning experiences (Weber et al. 2021).

In South Africa, the COVID-19 regulations had a destructive effect on the health system at many levels and impacted all six health system's building blocks, as described by the World Health Organization (WHO) (Mbunge 2020). From a governance and leadership perspective, the country had gone into a state of disaster where the *Disaster Management Act 57 of 2002* served as a legislative framework to coordinate responses to the threat. Consequently, the health care workforce, financing and medical products were all affected in managing the COVID-19 pandemic, leaving other areas of the health system's functioning in a vulnerable state.

From the beginning of successive lockdowns, all outpatient health services were suspended, and health care workers were redeployed. As a result, patients were unable to access health services for chronic conditions and rehabilitation services. There was a country-wide reduction in the number of patient visits in primary care, with the largest in the Western Cape province (31.1%) (Pillay et al. 2021). The need for mental health and substance abuse services increased (Mbunge 2020), but few people could access these services (De Man et al. 2021). The need for high-care and intensive-care beds increased the costs of the health service (Edoka et al. 2021). Consequently, up to 15% of the excess natural deaths in South Africa in 2020 may be attributed to health

services being overwhelmed (Moultrie et al. 2021). These health system disruptions were an additional challenge to student clinical training in South Africa. Figure 5.1 illustrates the impact of COVID-19 on the South African health system.

Despite the disruption to clinical services, there were also a number of mediating factors to support the continuation of clinical training. Firstly, there was a strong commitment from the universities and the Department of Health (DoH) to work together so that final-year rehabilitation professional students could graduate and commence community service posts in January 2021. Community service is a compulsory year of clinical service for new health professional graduates in public health facilities across South Africa (Reid et al. 2018). Secondly, national bodies like the Health Professions Council of South Africa (HPCSA) were proactive in responding to the pandemic. Thirdly, there was a close liaison between stakeholders to consider and recognise alternative approaches to clinical training. Consequently, by

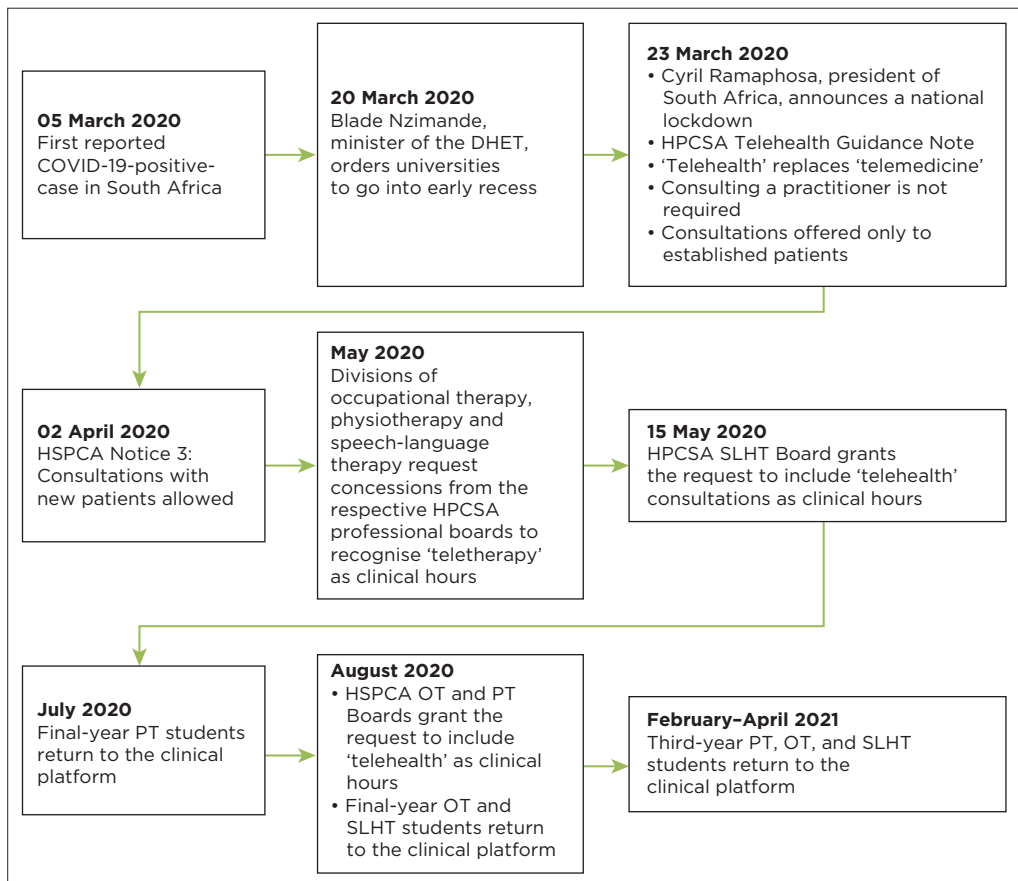
	Health systems pillars	Impact of the COVID-19 pandemic on the health care system
Health care system	 <b>Health workforce</b>	<ul style="list-style-type: none"> <li>• Specialist staff redeployed to COVID-19 areas in hospitals</li> <li>• Majority of staff service were reorganised</li> <li>• Skills development centred on COVID-19</li> </ul>
	 <b>Service delivery</b>	<ul style="list-style-type: none"> <li>• Embargo on non-essential service and elective surgery</li> <li>• No follow-up for persons with chronic illnesses or those with long COVID-19 symptoms</li> <li>• Community outreach halted</li> </ul>
	 <b>Medical products</b>	<ul style="list-style-type: none"> <li>• Reduced supply and provision of certain medical products (e.g. assistive devices for rehabilitation)</li> <li>• Issues with timeous delivery of medicines and follow-up care for those with existing co-morbidities</li> </ul>
	 <b>Financing</b>	<ul style="list-style-type: none"> <li>• Health budgets re-allocated to COVID-19</li> <li>• Focused procurement on PPE, IPC measures, oxygenation and ventilation equipment and skills development</li> <li>• Financing did not allow for recruitment of additional staff to maintain non-essential and chronic illnesses</li> </ul>
	 <b>Health information systems</b>	<ul style="list-style-type: none"> <li>• Limited information to clients of health services during COVID-19 pandemic</li> <li>• Limited access to information and facilities</li> </ul>
	 <b>Governance</b>	<ul style="list-style-type: none"> <li>• DMA was used as strategic framework during COVID-19</li> <li>• DMA also legislative framework for RSA</li> <li>• Overhaul of services during state of disaster</li> </ul>

Source: Adapted from the Rehabilitation in Health Systems Guide for Action (World Health Organization [WHO] 2019). Key: COVID-19, coronavirus disease 2019; PPE, personal protective equipment; IPC, infection prevention and control; DMA, Disaster Management Act 57 of 2002; RSA, Republic of South Africa.

**FIGURE 5.1:** Impact of the COVID-19 pandemic on health care systems.

July 2020, relevant professional boards of the HPCSA had approved changes to clinical training requirements, including online learning activities.

A fourth mediating factor was the change in HPCSA policy to permit telehealth services. Telehealth refers to the use of information and communication technologies to provide health care when professionals and service users are in different locations (WFOT 2014). Before 2020, telehealth was only permitted in South Africa when one medical practitioner was physically present in the room with a patient (Barit 2020). Other forms of telehealth were not explicitly sanctioned. At the onset of the pandemic, health care practitioners called for regulations to be brought in line with international guidelines (Townsend, Mars & Scott 2020). Thus, in April 2020, the HPCSA released three sequential statements, as summarised in Figure 5.2, that drastically changed the telehealth landscape in South Africa, including the sanctioning of telerehabilitation and consultation with first-time patients.



Source: Authors' own work.

Key: COVID-19, coronavirus disease 2019; DHET, Department of Higher education and Training; HPCSA, Health Professions Council of South Africa; SLHT, speech, language and hearing therapy; PT, physiotherapy; OT, occupational therapy.

**FIGURE 5.2:** Sequential statements that drastically changed the telehealth landscape in South Africa.

To meet the mandates of universities, the DoH and the HPCSA, rehabilitation training programmes needed to do the following:

- Think outside the box to identify clinical training opportunities that were feasible and that would enable students to cope with changes and new demands.
- Act promptly so that graduations in 2020 were not delayed, allowing qualified students to commence their community service year on time.
- Collaborate and build trust with various stakeholders, for example, professional boards, students, university administration and health managers.
- Develop strategies to implement evidence-based innovations that would facilitate clinical training and service delivery.

Telerehabilitation was one evidence-based innovation that had the potential to improve safety and maintain service delivery at a distance (Chitungo et al. 2021). Telerehabilitation could be considered as both 'telehealth care' or 'telemedicine'. Clinical service delivery is known as 'telemedicine', whereas the management of disability and health is known as 'telehealth' (Winters 2002). Services such as 'teletherapy' could be considered a form of 'telerehabilitation', which overlaps with telemedicine; however, the remaining model of telerehabilitation is considered a form of telehealth care (Nizeyimana, Joseph & Louw 2022). In this chapter, we will use the term 'telerehabilitation' and 'telehealth' interchangeably.

Telerehabilitation may include, but is not limited to, services such as prevention, assessment, monitoring, intervention, clinical supervision, education with service users and their carers, consultation, counselling and coaching. These services may be provided to an individual, service user/carer dyad or a small group (De Wit et al. 2021). The mode of delivery may include synchronous or real-time engagements between the health professionals and service users through videoconferencing, telephone, telecare devices, mobile or computer applications, and gaming technologies (Brennan, Mawson & Brownsell 2009; Sarsak 2020). Asynchronous activities include sending and receiving photographs, videos, documents and links for the service users to use at a time that suits them (Lee, Davenport & Randall 2018). Service delivery models may include exclusive use of telerehabilitation or a blended approach (De Wit et al. 2021). Thus, telerehabilitation also offers a wide range of learning opportunities for clinical training.

Although telerehabilitation was approved at the national council level, the country had no information on whether South African health professionals had the capacity and knowledge needed to adopt telerehabilitation within the local context. According to Signal et al. (2020), the development of knowledge and skills in telerehabilitation is a core competency for both undergraduate training and professional development. However, this knowledge and skills had not been developed in South Africa because of the previous HPCSA restrictions on the provision of telerehabilitation services.

Thus, having a long-term vision and developing sustainable innovations were important for the continued enhancement of rehabilitation services, including clinical training of health profession students beyond the pandemic. The solutions we considered to maintain student clinical training during the pandemic also had to strengthen and enable rehabilitation in the local health system, especially for people with disabilities who could not receive much-needed services. Therefore, we required guidance through a rapid literature search and expert consultation on the key considerations of core knowledge and skills needed for the successful implementation of telerehabilitation. In addition, we identified the local contextual factors and telerehabilitation needs through a pilot study assessing stakeholders' (clinical managers, administrators and clinicians) readiness to adopt the telerehabilitation modality for service delivery and clinical training of rehabilitation students.

## ■ Research question

What are the requirements for the development and integration of telerehabilitation into service delivery and clinical training at a South African university?

## ■ Aim

We aimed to focus on a collaborative, co-development process to integrate telerehabilitation into the clinical training of Stellenbosch University undergraduate rehabilitation students on the clinical training platform during the COVID-19 pandemic. These rehabilitation students included students from the divisions of *physiotherapy* (PT), *occupational therapy* (OT), and *speech-language and hearing therapy* (SLHT).

## ■ Objectives

The objectives of the study are to:

- Design an inclusive approach to integrate telerehabilitation into the clinical training of undergraduate rehabilitation students (PT, OT and SLHT).
- Value lessons learnt and obtain guidance from national and international experts in telerehabilitation.
- Understand and address the training needs of students, clinicians, clinical educators and facilitators.
- Understand the contextual implications of telerehabilitation (risks and mitigation strategies) and the readiness of the clinical platform for telerehabilitation.
- Plan and learn from a real-life pilot study to integrate telerehabilitation as part of clinical training for rehabilitation students.



## ■ Methods

A case study is often used to obtain an in-depth understanding, description and exploration of a new phenomenon, for example, gaining insight into the pathways, implications and challenges of a new policy or health care service model in depth and within its natural context (also known as a ‘naturalistic’ design) (Crowe et al. 2011). The initiative of the Department of Health and Rehabilitation Sciences (DHRS) at SUN was named the ‘Stellenbosch University Telerehabilitation Initiative’ (SUTI). The initiative involved several meetings, chaired by the executive head of the DHRS and later by the initiative coordinator, the review of available documentation from the appropriate governing bodies and published literature on core competencies for the delivery of telerehabilitation. For this reason, a single intrinsic case design (Crowe et al. 2011; Stake 1995) for the investigation, co-development and integration of telerehabilitation into the clinical training of undergraduate rehabilitation students on the clinical training platform at Stellenbosch University was used.

The data informing our understanding of the integration of telerehabilitation into clinical training emanated from several sources:

1. **Formal minutes or recordings of meetings (departmental management meetings, steering committee meetings, initiative coordinator meetings, stakeholder meetings and meetings with collaborators):** Because of the pandemic, most of the meetings were conducted online, but about 10% were face-to-face. These meetings were chaired by the executive head of the DHRS and the initiative coordinators. The initiative coordinators gave feedback at four management meetings, eighteen steering committee meetings, weekly coordinator team meetings over 18 months and one stakeholder meeting with representatives from each division.
2. **Online meeting recordings and minutes of informal stakeholder engagement sessions with national and international telerehabilitation experts:** This included eight meetings with local and international experts. We also had multiple discussions with clinicians on the clinical platform.
3. **Formal progress reports compiled by the coordinator team:** The initiative coordinators generated progress reports and initiative updates in December 2020 and February, March, May, July and December 2021.
4. **Online meeting recordings and minutes with the Western Cape DoH representatives, health facility managers, or lead clinicians:** We had one meeting with the DoH. In addition, the initiative coordinators reached out to facility managers and lead clinicians on the SUN clinical platform to initiate conversations about the potential roll-out of telerehabilitation activities for student training.

## ■ Data analysis and interpretation

Our data collection and analysis remained an iterative process that was informed by a higher education clinical competency assessment framework known as Miller's pyramid (Miller 1990). The process of data collection, analysis and interpretation are described for each of the objectives in the results section subsequently.

## ■ Results

This section describes the process and outcomes of the five objectives, which collectively form the central tenet of this case study.

### ■ Design an inclusive approach to integrate telerehabilitation into the clinical training of undergraduate rehabilitation students

#### □ Process

The management committee (consisting of the executive head and the divisional heads of the DHRS) conceptualised the initiative and submitted the funding application to the Faculty of Medicine and Health Sciences at SUN. The funding application was to commence the initiative and included a request for human resources and infrastructure.

The initiative included the three rehabilitation divisions (PT, OT and SLHT) as the management team envisaged an integrated approach to telerehabilitation on the clinical platform. Communication and collaboration were crucial from the start. Therefore, the divisional heads engaged with their colleagues prior to the funding application and regularly thereafter to keep them updated, obtain buy-in, and mitigate challenges and risks proactively.

As the initiative involved all three rehabilitation programmes, adherence to all clinical regulatory guidelines from the relevant HPCSA boards was of utmost importance to understand the provisions made during the pandemic and uphold ethical service delivery. Therefore, the management team and initiative coordinators familiarised themselves with the national and international guidelines, regulatory requirements and the *Protection of Personal Information Act 4 of 2013* (PoPIA) (Buys 2017) to ensure acceptability for the students to earn clinical hours through participation in telerehabilitation activities. In addition, they attended five courses and webinars on the use of telerehabilitation to broaden their knowledge and skills in the use of telerehabilitation.

## □ Outcomes

A key outcome of this initial phase of the project was a successful funding application to appoint a dedicated team who will have the time to develop the skills and knowledge to steer the exploration of a sustainable model for the integration of telerehabilitation on our clinical platform. A steering committee was formed and comprised three senior lecturers from the three rehabilitation divisions, of which two are expert curriculum developers. Their focus was to develop the telerehabilitation undergraduate curriculum. In addition, three coordinators for the telerehabilitation initiative were appointed as representatives of the three rehabilitation divisions. One of the coordinators also acted as the overarching coordinator for the entire project. The roles and responsibilities are outlined in Table 5.1. Provisions were also made for *ad hoc* consultants at SUN on technical specifications and support, guidance and

**TABLE 5.1:** Key roles of the three initiative coordinators.

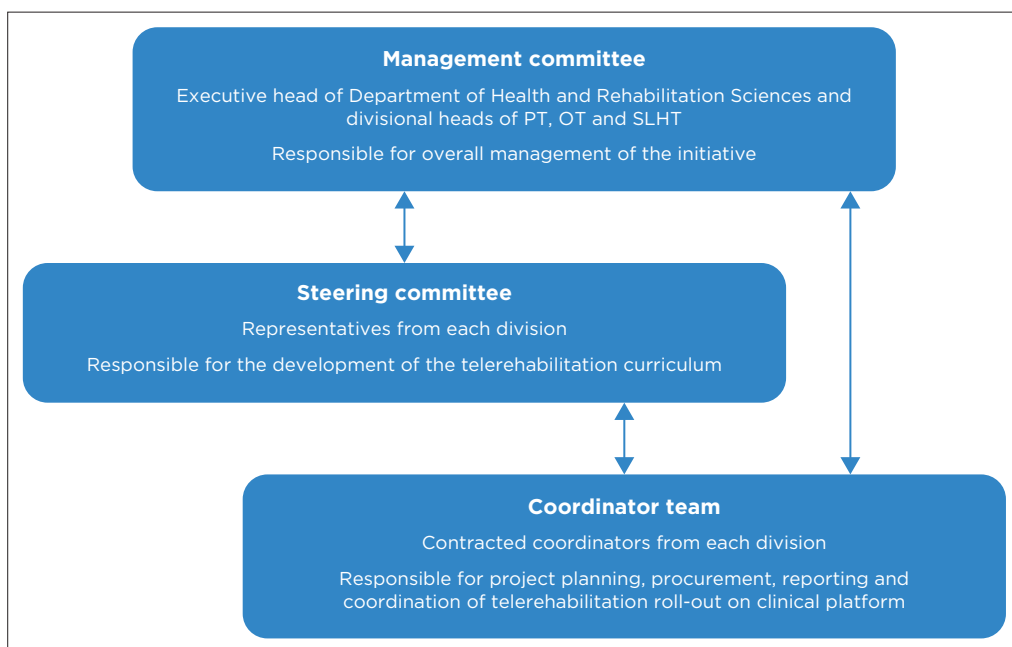
<b>Responsible coordinator (OT)</b>	<b>Supporting coordinator (PT)</b>	<b>Supporting coordinator (SLHT)</b>
<ul style="list-style-type: none"> <li>• Develop a detailed project plan with deliverables and timeframes (in collaboration with DHRS management)</li> <li>• Investigate and propose novel teaching and assessment methods that include evidence-based outcome measures and patient feedback</li> <li>• Ensure alignment of new programmes with South African regulatory, national associations and ethical guidelines</li> <li>• Develop interprofessional curriculum content, for example, e-learning module for students across the three divisions</li> <li>• Develop referral and evidence-based care pathways</li> <li>• Identify the knowledge, skills, attitudes and behaviours that students and graduates need to deliver effective telerehabilitation</li> <li>• Seek advice and guidance from educational institutions nationally and internationally that have established telerehabilitation training programmes and rehabilitation clinics</li> <li>• Investigate the merits of different telerehabilitation platforms and tools</li> <li>• Report and ensure communication with all key role players</li> <li>• Manage projects and deadlines (weekly briefings)</li> <li>• Manage procurement</li> </ul>	<ul style="list-style-type: none"> <li>• Identify potential referral sources or routes</li> <li>• Liaise across the three rehabilitation divisions regarding the selection of platforms and infrastructure requirements</li> <li>• Scope which telerehabilitation methods are already practised by SUN rehabilitation staff and students</li> <li>• Develop evidence-based training material for staff (supervisors)</li> <li>• Manage logistical issues, such as space, timetabling, student capacity, procurement and inclusion of telerehabilitation as part of clinical training</li> <li>• Assess how the introduction of telerehabilitation into the curriculum could improve teaching and learning outcomes in the three rehabilitation divisions and ultimately improve patient rehabilitation outcomes across South Africa</li> </ul>	<ul style="list-style-type: none"> <li>• Contribute expertise</li> <li>• Provide input and implications for telerehabilitation</li> <li>• Provide logistical information on how telerehabilitation can be included in clinical training</li> </ul>

Key: PT, physiotherapy; OT, occupational therapy; SLHT, speech-language and hearing therapy; DHRS, Department of Health and Rehabilitation Sciences; SUN, Stellenbosch University.

input to ensure synchrony during the roll-out of services on the clinical platform.

A meeting with key divisional stakeholders, which included the executive and divisional DHRS heads, the clinical coordinators overseeing clinical training and placements of each division and the coordinating team, was held in December 2020. During this online Microsoft Teams meeting, the rationale and overarching principles of the initiative were explained, and sufficient time was allocated for questions and discussion. In principle, all three divisions committed to participating and suggested feasible strategies, such as integrating telerehabilitation into existing services rather than replacing services. Therefore, telerehabilitation would complement existing services. In addition, the meeting attendees nominated clinical areas that would be appropriate for piloting initial steps in integrating telerehabilitation on the clinical platform.

Finally, another outcome of the stakeholder meeting was clarifying a communication and management structure (see Figure 5.3). The coordinating team initially gave weekly feedback to the stakeholders via emails, and as the initiative progressed, they gave monthly feedback via emails, meetings and presentations. All reports, documents and presentations were stored on a shared drive, accessible to all management role players. The coordinating team reported



Key: PT, physiotherapy; OT, occupational therapy; SLHT, speech-language and hearing therapy.

**FIGURE 5.3:** Structure of initiative communication and management.

directly to the steering committee about training module-related decisions. The coordinating team also provided regular feedback to the executive and divisional heads during their management meetings. The principles followed for communication were regular feedback, including all stakeholders, a shared document space, record keeping, project planning and regular progress reports.

## ■ Value lessons learnt and obtain guidance from national and international experts in telerehabilitation

### □ Process

At the start of our initiative, it was apparent that a great deal of research existed within the field of telehealth, and during the height of the COVID-19 pandemic, many more publications were added to the online databases monthly. A decision was made to reach out to experts who were involved in telerehabilitation within our respective professions and undergraduate training to learn from their experience. We used our respective professional networks to reach out to practitioners, researchers and academics via email to determine their current use of telerehabilitation services and the implementation of training within their respective settings. Through journal searches and citation tracking, we determined who the local and international experts were through their publications on telerehabilitation, and we reached out to them via email as well. These efforts resulted in meetings with experts from two universities in Australia (with more than fifteen years of experience in telehealth and students placed at a telerehabilitation clinic or transitioned rapidly to telerehabilitation during the COVID-19 pandemic) and two South African universities with research experience in telerehabilitation and speech therapy.

The telerehabilitation team first connected with these experts through email consultations and followed up with meetings via online platforms between November 2020 and March 2021. The team had one meeting each with both the South African universities and one Australian university, and five meetings with the telerehabilitation programme coordinators of the other Australian university. During these meetings, the telerehabilitation team focused on gaining information about the process and scope of telerehabilitation activities on their clinical platforms and in their undergraduate programmes. This included discussing the core knowledge and skills in telerehabilitation, training modules, software used, assessment methods, supervision needs and sustainability plans for telerehabilitation and learning outcomes. The logistics of providing hardware and software for these activities on the clinical platform and the physical location of students for these sessions were also discussed. The local experts provided contextually relevant insight into South Africa and the potential for future collaboration. Expert consultation allowed the team to incorporate and implement proven principles and avoid known pitfalls.

To investigate suitable software for telerehabilitation in our context, we consulted literature (Combi 2016; Cottrell 2020) and reached out to clinicians on our clinical platform who were already engaging in telerehabilitation. We completed a thorough internet search to understand the leading software providers within telerehabilitation. We contacted three software providers and had various consultations with all three, which included demonstrations of the software and questions based on our contextual needs and predetermined criteria.

## □ Outcomes

Lessons learnt from consultations with experts guided the decisions made regarding the following: the model for integration of telerehabilitation, equipment (hardware and software), key competencies for student training and telerehabilitation service delivery, student assessment methods, clinical supervision needs and the implementation of telerehabilitation at specific clinical sites. Consultations with national and international universities and experts in the use of telerehabilitation and student training have collectively informed the model applied for the SUTI. Incorporating these principles as outlined in Table 5.2 will ensure the sustainable implementation of telerehabilitation services on the clinical platform.

The hardware and software requirements for our context are listed in Table 5.3. Although successful telerehabilitation sessions can be delivered with lesser equipment, we opted for technology that will be future-proof and maximise efficiency. Based on our investigation of the available software, we subscribed to telerehabilitation software that met the criteria and seemed most appropriate for our context (see Table 5.3).

Core knowledge and skills identified through the literature review and expert consultations included the following: ethical and technical principles of telerehabilitation, the delivery of group sessions online, motivational interviewing, goal setting with clients, video essays and the telerehabilitation cycle.

There was consensus among the international universities that no particular assessment guidelines were needed or developed for student assessment of

**TABLE 5.2:** Proposed model for the integration of telerehabilitation at Stellenbosch University.

<b>Proposed model for the integration of telerehabilitation at Stellenbosch University</b>	
1.	A phased approach will ensure that barriers are addressed in a controlled and safe manner for providers and patients
2.	A hybrid service delivery model is preferred by patients and therapists and addresses some of the concerns about the assessment of patients
3.	Telerehabilitation lends itself to supervision, expert consultation, caregiver training and group therapy, and thus, we will start our initiative with group caregiver training
4.	Task sharing between students from different divisions is an opportunity for growth on our clinical platform
5.	The creation of a remote hub provides future opportunities for student placement for clinical hours

**TABLE 5.3:** Contextual hardware and software requirements.

Requirements	
Hardware	Software
Computer: • HD camera • High-resolution screen • Solid-state hard drive • Sufficient RAM (8GB+) • Ethernet port (in case of unstable Wi-Fi)	<ul style="list-style-type: none"> <li>• Adheres to PoPIA (privacy and security)</li> <li>• Web-based services (no app requirements on the end of the service user)</li> <li>• One-click access (no email address required)</li> <li>• Low bandwidth use</li> <li>• User-friendliness</li> <li>• Can do audio-only calls</li> <li>• Can do video calls</li> <li>• Can share files with the service user</li> <li>• No cost to the service user (such as subscription fees)</li> <li>• Cost-effectiveness for the provider (sustainability)</li> <li>• Operability on multiple devices and systems</li> </ul>
Connectivity: • Access to high-speed Internet • Ethernet (LAN) cable (if required)	

Key: PoPIA, *Protection of Personal Information Act 4 of 2013*; Wi-Fi, wireless Internet connectivity; LAN, local area network; HD, high-definition; RAM, random access memory

telerehabilitation activities. However, standard assessment criteria could be applied, that is, the Assessment of Physiotherapy Practice Performance Indicators (Dalton, Davidson & Keating 2012). The clinical supervision needs were also perceived as similar between in-person rehabilitation activities and telerehabilitation activities.

During a meeting with the coordinating team and the executive and divisional heads, the decision was made to reach out to a few clinical sites to initiate discussions and identify needs through an informal readiness assessment.

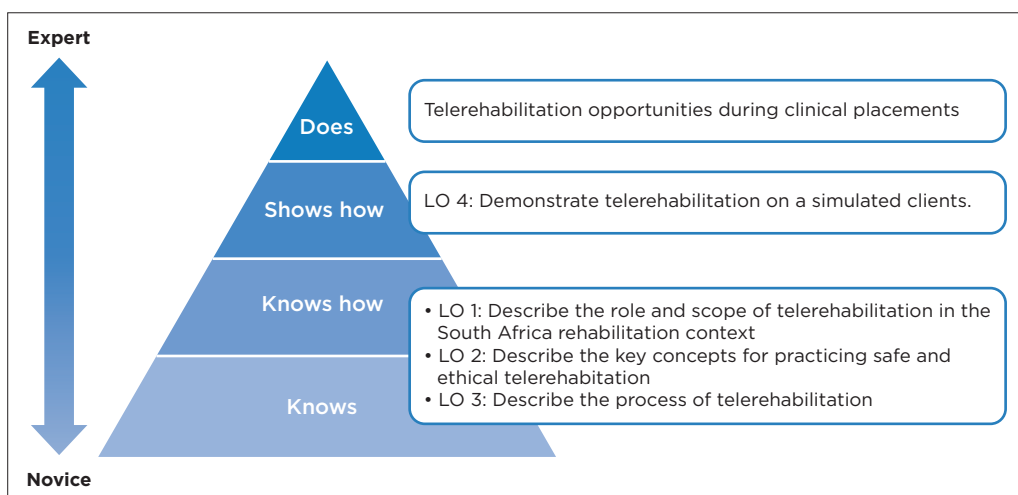
## ■ Understand and address the training needs of students, clinicians, clinical educators and facilitators

### □ Process

The coordinating team reviewed all national and international guidelines that inform the ethical delivery of telerehabilitation in South Africa and created a telerehabilitation ethics online course for staff, clinical supervisors and clinicians on the clinical platform. The proposed core training components included regulatory guidelines and scope of practice, technical and practical guidelines, informed consent, benefits, risks and limitations, group rehabilitation principles and evidence-based practice. As an incentive, the training was accredited for continuous professional development points for all the staff members who completed the training, read the prescribed journal article and passed the multiple-choice questionnaire. Staff members familiar with the content of the student training can provide appropriate and insightful supervision and guidance for students and can apply this knowledge as part of their own set of skills when engaging with patients.

The steering committee was tasked with developing learning outcomes and learning objectives for the student training module. The steering committee completed a rapid review of published research on core competencies and learning outcomes of telerehabilitation curricula. Steering committee members also participated in the meetings with the experts, where core competencies and learning outcomes were discussed. Two of the steering committee members are teaching fellows at Stellenbosch University with extensive experience in curriculum development. They followed the process for constructive alignment with an intentional connection between learning outcomes, learning activities and assessment tasks (Biggs 1996). To further inform the content, they considered Miller's pyramid, which is useful for assessing clinical competence (Miller 1990). This included a scaffold approach to developing the learning outcomes, teaching content and assessment methods on a continuum from novice to expert, through clinical skills levels of 'know about', 'know how', 'show how' and 'does' (see Figure 5.4).

After consulting the literature on key considerations and core skills for delivering telerehabilitation, the coordinating team was tasked with developing an evidence-based, contextually relevant training module for students to improve their knowledge of the delivery of ethical telerehabilitation. This included initial learning outcomes linked to the training content. Every student in a clinical setting who engaged with any form of telerehabilitation was required to complete the training module and submit a recorded mock session for evaluation by staff in our team. In addition, clinicians, clinical supervisors involved in student training and postgraduate OT students were given access to the core training components of the student training module.



Key: LO, learning outcome.

**FIGURE 5.4:** Miller's pyramid and telerehabilitation module learning outcomes.



All clinicians, supervisors and postgraduate students who engaged in the training were asked to participate in a peer-review process of the learning content and the learning outcomes, identify any gaps in the content and make suggestions for addressing these gaps. The peer-review results were collated and analysed to inform the revision of the training module.

## □ Outcomes

The steering committee developed the learning outcomes as outlined in Table 5.4. The initial training module included sections on the general ethical and technical principles of telerehabilitation, as well as specific principles and guidelines for each profession, delivery of group sessions online, motivational interviewing, goal setting with clients, video essays and the telerehabilitation cycle. The training was offered in an online, pre-recorded format. A total of

**TABLE 5.4:** Learning outcomes for telerehabilitation training module.

Learning outcome	Learning objective	Core content	Teaching and learning activity
LO 1: Describe the role and scope of telerehabilitation in the South African rehabilitation context	Describe the development of telerehabilitation and how this enables the extension of current services	Telerehabilitation definitions, scope of services, benefits, risks and limitations	Session 1: Introduction to telerehabilitation  Quiz: Knowledge consolidation with instant feedback
	Describe the South African position statement on telerehabilitation  Explain the differences between intervention and management in-person versus when using telerehabilitation	Relevant WHO, HPCSA guidelines, scope of practice, PoPIA, measures to ensure privacy and consent  Definitions, terminology and modes (synchronous/asynchronous)  Strategies for adjusting modalities to the online environment. What can or cannot be done online.  Planning a telerehabilitation session – principles  Equivalent effectiveness of interventions in-person versus telerehabilitation	
	Describe the limitations and risks associated with telerehabilitation within the South African context	What are the risks associated with telerehabilitation?  Security and patient safety (falls, injury) risk mitigation	Read article: 'Patient safety risks associated with telecare: a systematic review and narrative synthesis of the literature' (Guise, Anderson & Wiig 2014)  Make a list of risks with definition of each  Workshop or choice activity on the Moodle platform

Table 5.4 continues on next page→

**TABLE 5.4 (cont.):** Learning outcomes for telerehabilitation training module.

<b>Learning outcome</b>	<b>Learning objective</b>	<b>Core content</b>	<b>Teaching and learning activity</b>
LO 2: Describe the key concepts for practising safe and ethical telerehabilitation	Describe the guidelines that inform telerehabilitation practice	Relevant guidelines, scope of practice, PoPIA, measures to ensure privacy, consent, security and patient safety and risk mitigation	Session 2: Ethics in telerehabilitation in South Africa  Session 2a: OT specific guidelines  Session 2b: PT specific guidelines  Session 2c: SLHT specific guidelines  Quiz: Knowledge consolidation with instant feedback
	Interpret the regulatory frameworks that apply to telerehabilitation, including, but not limited to, the HPCSA guidelines on Telehealth, the HPCSA Ethical Conduct Booklet 10 General Ethical Guidelines for Good Practice in Telemedicine and PoPIA  Explain the precautions applicable when providing a rehabilitation service remotely with groups of people	Group telerehabilitation principles, OTASA group guidelines and group norms	
LO 3: Describe the process of telerehabilitation	Describe the stages of the telerehabilitation cycle	Definition, cycle timeline and benefits of the session cycle	Session 3: The process of telerehabilitation  Quiz: Knowledge consolidation with instant feedback
	Compare individual with group intervention and management using telerehabilitation	Technical considerations, planning the session, appearance, consent, session checklist, group session planning, group therapy guidelines and group planning using Cole's seven steps	
	Describe the communication challenges one may encounter during a telerehabilitation session	Technical considerations, planning the session, appearance, consent, session checklist, group session planning and group therapy guidelines	
	Propose strategies to overcome these challenges		
	Identify barriers for use of telerehabilitation to deliver home intervention and programme implementation in low- to middle-income countries (LMICs)	Contextual barriers to telerehabilitation and home programmes	Read articles and identify barriers and facilitators patients may experience when engaging in telerehabilitation  Article: 'Factors influencing barriers and facilitators to in-home video telehealth for dementia management' (Megan et al. 2021)  Quiz: Knowledge consolidation with instant feedback

Table 5.4 continues on next page→

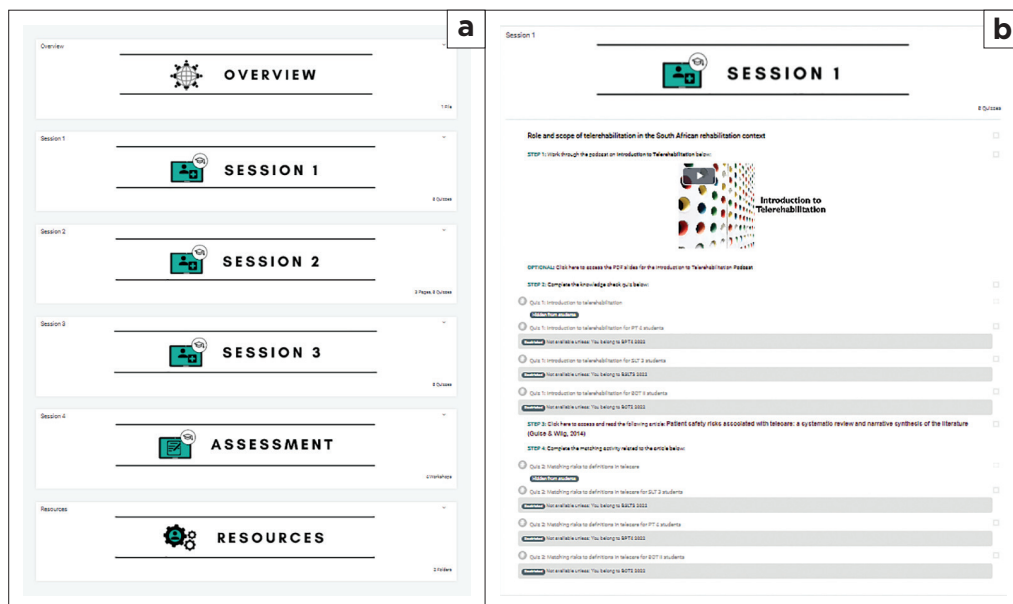
**TABLE 5.4 (cont.):** Learning outcomes for telerehabilitation training module.

Learning outcome	Learning objective	Core content	Teaching and learning activity
LO 4: Demonstrate telerehabilitation on a simulated client	Demonstrate the technical skills for using a secure online platform for client interaction (i.e. schedule a session, establish connections, use the secure online platform and save data at the end of a session)	Two credits – preparing for a live session, practising with other students, planning an assessment or intervention using the online platform and learning how to use MS Teams	One hour: Practical lecture on the use of the platform (MS Teams)  Two hours: Practising the use of platform, checklist and database on at least one platform. Each student should have at least one hour of exposure.
	Demonstrate communication skills for telerehabilitation (i.e. using a checklist, optimise communication, obtain or re-establish consent and determine privacy)		One hour: Submission of a video demonstrating basic skills on Teams as a Workshop activity. Each student marks two other students' videos using a rubric. Lecturer moderates the submissions – 10%-20% moderation.
	Demonstrate assessment or intervention		

Key: LO, learning outcome; HPCSA, Health Professions Council of South Africa; PoPIA, *Protection of Personal Information Act 4 of 2013*; WHO, World Health Organization; OTASA, Occupational Therapy Association of South Africa; MS, Microsoft.

158 undergraduate students engaged in the training, while eight staff members and clinicians completed the training, read the prescribed journal article and passed the multiple-choice questionnaire.

A peer-review process by stakeholders led to the identification of gaps in the current training module and thus the revision of the training content to only include general ethical and technical principles of telerehabilitation, as well as specific principles and guidelines for each profession, delivery of group sessions online and the telerehabilitation cycle. The assessment methods' update included quizzes with instant feedback to review knowledge after each pre-recorded lecture or article read. A practical workshop was also added to allow students to practise applying basic telerehabilitation guidelines using a checklist to establish consent, privacy and communication and an opportunity to peer mark two submissions. The learning outcomes reflect Miller's pyramid of learning and include 'knows' and 'knows how' for learning outcomes one, two and three and 'shows' for learning outcome four. The module content was also updated to improve the usability of the learning content on the Moodle platform (see Figure 5.5). As the module has been updated, 340 undergraduate rehabilitation students have been enrolled, and 124 have already engaged in the training in the 2022 academic year.



Source: Authors' own work.

**FIGURE 5.5:** Presentation of module on the Moodle platform and sample session.

## ■ Understanding the local contextual implications of telerehabilitation (risks, barriers and mitigation strategies) and readiness of the clinical platform for telerehabilitation

### □ Process

Based on expert consultation and literature, it was evident that in order to have a successful implementation of our telerehabilitation innovation, readiness is required from all key stakeholders (Jennett et al. 2005). Therefore, it was important to identify core factors that may influence stakeholders' readiness to adopt telerehabilitation as a service delivery modality and assist rehabilitation students in executing the classroom knowledge into clinical practice via telerehabilitation technology. As a first step towards understanding the readiness of our stakeholders, a face-to-face meeting was held with all stakeholders from the three divisions (this was not previously possible because of COVID-19). This meeting aimed to provide feedback and updates on the departmental telerehabilitation initiative; explore and understand a departmental and divisional vision for telerehabilitation; share experiences, lessons learnt and barriers; co-develop implementation strategies; and develop divisional and departmental roll-out plans for the next phase(s) of the telerehabilitation initiative. Aspects of previously published readiness questionnaires informed additional discussions with clinicians at identified sites for the potential implementation of telerehabilitation.

As no readiness assessments specific to the South African context were available, the telerehabilitation team adapted an instrument from a standardised readiness assessment tool developed by the University of Calgary, focusing on organisational readiness, practitioners' readiness and patient readiness (Pollak et al. 2019). The first step in this process involved sending this existing readiness assessment tool to divisional heads and clinical coordinators from the three divisions for consideration.

Feedback from this round of review included comments on the use of contextual language, more background information needed on new concepts, and the current use of telerehabilitation within each organisation. Feedback also included developing questions about clinicians' perception of patient readiness and including more qualitative questions to help contextualise the readiness. The readiness assessment tool was then adapted from these responses, and another round of divisional feedback was sought. Minor adjustments included format changes and separating compound questions into separate items.

The adapted tool for the readiness assessment was a combination of multiple-choice and open-ended questions. The adapted assessment tool for this study comprised three different sections:

- Section 1 gathered information about the demographic characteristics of the participants.
- Section 2 targeted organisational representatives (rehabilitation managers and administrators) to assess the organisational readiness such as organisational core readiness, organisational engagement & planning readiness, organisational workplace readiness and organisational technical readiness.
- Section 3 assessed the practitioners' (clinicians and clinical educators) core readiness, engagement readiness and structural readiness to adopt telerehabilitation.

A study protocol was developed to complete the readiness assessment of all sites on the clinical platform using the adapted tool collectively developed. Ethics was received in January 2022, with the ethics reference number HREC N21/11/126. The main aim of this readiness assessment was to (1) determine the current use of telerehabilitation in the clinical setting; (2) determine the willingness of the clinical sites to incorporate telerehabilitation for students' clinical training; and (3) determine the organisation's needs for support and barriers to the implementation of telerehabilitation at clinical sites.

## □ Outcomes

The importance of a readiness assessment on the organisational level, clinician level and patient level has been established. As expected, with the use of new modalities in rehabilitation, there are different levels of readiness

in stakeholder adoption. Based on our discussions with stakeholders and clinicians, it was evident that incorporating a new initiative such as telerehabilitation would have challenges. Not all clinical sites, clinicians or staff are champions for telerehabilitation. However, most of the stakeholders could envision the potential opportunities of telerehabilitation. Some of the clinicians were already engaging in telerehabilitation activities and welcomed the idea of support for their endeavours. An outcome of the stakeholder meeting was the proactive identification of potential contextual risks and the accompanying mitigation strategies as provided by the stakeholders (see Table 5.5).

When a phased approach for the implementation of telerehabilitation is followed, services will be introduced at one clinical site at a time, low-risk activities will be selected, clinicians and clinical supervisors will receive access to training and careful decisions will be made following a pilot study of these services.

**TABLE 5.5:** Potential risks and barriers and proposed mitigation strategies.

Potential barrier and risk	Mitigation strategies
Time-consuming nature of converting services online	<ul style="list-style-type: none"> <li>• Assistance from the telerehabilitation team on the development of SOPs, guidelines and checklists for student engagement with telerehabilitation</li> <li>• Sharing of resources across the clinical sites</li> </ul>
Knowledge of the students	<ul style="list-style-type: none"> <li>• Every student engaging in telerehabilitation should have completed the training module</li> <li>• Students engaging with telerehabilitation should be accompanied by a clinician or supervisor</li> <li>• Students should be working in pairs for the first few weeks</li> </ul>
Infrastructure needed for telerehabilitation (hardware and software) on the side of the service user and service provider	<ul style="list-style-type: none"> <li>• The initial funding application included funding for hardware and software</li> <li>• Coordinator team scrutinise literature and consult with information technology technicians to ensure that suitable software and hardware are purchased from the start</li> <li>• If service users do not have access to a smartphone, voice calls could be used</li> <li>• Service users are connected through home-based careers and their dedicated service devices</li> </ul>
Patient's privacy and safety	<ul style="list-style-type: none"> <li>• Ensure patient privacy by using PoPIA-compliant software with technical support from the university</li> <li>• Develop a patient safety screening tool</li> <li>• Always conduct a face-to-face assessment first and assess if the patient is suitable for safe telerehabilitation</li> </ul>
Data are expensive, and patients may not be able to access telerehabilitation if they have no data	<ul style="list-style-type: none"> <li>• A plan was devised to apply for social impact funding from the FMHS in order to fund patient data requirements</li> <li>• Patients could engage in phone calls that are not dependent on data</li> </ul>
Lack of dedicated space for telerehabilitation	Establish a hub (room on campus) with satellite hubs where students could access hardware and software and engage in telerehabilitation
Connectivity issues (lack of access to Wi-Fi)	<ul style="list-style-type: none"> <li>• Connect to these service users using landlines</li> <li>• Consider that these service users may be more suitable for face-to-face sessions</li> </ul>

Key: PoPIA, *Protection of Personal Information Act 4 of 2013*; SOPs, standard operating procedures; FMHS, Faculty of Medicine and Health Sciences; Wi-Fi, wireless fidelity.

## ■ **Plan and learn from a real-life pilot study to integrate telerehabilitation as part of clinical training for rehabilitation students**

### □ **Process**

From the literature review, expert consultation and stakeholders' meeting, the need for a pilot phase for the roll-out of telerehabilitation services on the clinical platform was evident. For the pilot phase, the following was required: Basic telerehabilitation infrastructure, including the stakeholders' readiness assessment, a dedicated telerehabilitation facility (hub) providing hardware and software, supervision personnel and training. The centralised hosting of hardware, software and data management was a decision modelled after consultation with the universities that had been engaging in telerehabilitation as part of their clinical training for students over the last 15 years. The establishment of this hub meant that students could be placed at a clinical telerehabilitation block where all clinical hours for the block were acquired via this modality.

### □ **Outcomes**

Establishing a telerehabilitation hub on campus and complementing this with satellite hubs at various clinics were the first steps to future-proofing the use of this modality. The hub included seven laptops, meeting our predetermined minimum requirements for effective telerehabilitation communication (see Table 5.3), each with dedicated and password-protected Microsoft (MS) Teams accounts through SUN. The initiative coordinator team or clinical supervisors and clinicians provided technical and clinical supervision for all sessions. As previously mentioned, all students who engaged with patients via telerehabilitation had to complete the training module first.

A pilot study was conducted at a rehabilitation facility that had a need for telerehabilitation services and was already engaged in in-person interprofessional home-based carer training workshops. They expressed a need to continue these workshops during lockdown to ensure continuous service delivery through engagement in a telerehabilitation pilot study. The clinicians and clinical supervisors developed a set of guidelines for the planning, implementation and adaptation of these groups for telerehabilitation services. Through conducting the pilot study, a further need for telerehabilitation consent forms, session checklists and data management was identified and addressed. After two cycles of group workshops via telerehabilitation, the home-based carer training model was established, including guidelines for planning and managing these workshops. These guidelines were then shared with other clinical sites delivering similar services and have the potential to sustain these training workshops via telerehabilitation. Box 5.1 provides a summary of the outcomes and lessons learnt from the pilot study.

**BOX 5.1:** Outcomes and lessons learnt from the pilot study.**Outcomes and lessons learnt from the pilot study**

Standard operating procedures for all aspects of telerehabilitation services need to be developed continuously to ensure standards of service delivery are upheld.

Standardised documentation is needed and includes consent forms and session checklists for group and individual sessions.

Tracking of student telerehabilitation activities is needed for future funding of infrastructure and training (this includes time spent on planning, synchronous and asynchronous patient activities and supervision) and planning of clinical activities.

There is a need for a repository for shared resources such as instructional videos (exercises, patient transfers, etc.), pamphlets and infographics.

There is a need for a database for the electronic storage of patient information and recordings of telerehabilitation sessions related to telerehabilitation services on the clinical platform.

Each clinical site should systematically identify opportunities for the safe and effective delivery of services to complement or enhance current processes, such as screening patients on waiting lists via telephone calls and support groups for chronic care patients.

Eligibility criteria for patients to assess risk and suitability of referral to telerehabilitation services should be developed.

## ■ Discussion

This case study focused on the interdisciplinary collaborative co-development process to integrate telerehabilitation into the clinical training and service delivery of SU undergraduate rehabilitation students and staff during the COVID-19 pandemic. In this section, we discuss the key critical factors that contributed to the success of the project.

## ■ Interprofessional collaboration

The process of integrating telerehabilitation into clinical training was initiated based on an interprofessional collaborative approach involving the executive head of DHRS and the divisional heads of the three divisions, namely, PT, OT and SLHT. A collaborative interprofessional approach has been defined as a process that includes communication and decision-making between professionals from different disciplines, enabling grouped knowledge and skills (Bridges et al. 2011). A study that aimed to explore the perception of allied health professionals regarding interprofessional collaborations in primary health care (PHC) revealed five major themes for collaboration, including (1) shared philosophy, (2) communication and clinical interaction, (3) physical environment, (4) power and hierarchy and (5) financial considerations (Seaton et al. 2021).

As this initiative involved three different divisions, clear communication (via regular meetings, emails and reports), cooperation, mutual trust and respect were crucial. The main elements of collaborative practice include



responsibility, accountability, coordination, communication, cooperation, assertiveness, autonomy, and mutual trust and respect (Bridges et al. 2011). These elements of the collaborative approach provided valuable guidance and played a key role in the success of this interprofessional initiative.

## ■ **Establishment of telerehabilitation coordinating team and steering committee champions**

Through regular open communication and collaboration, the interdisciplinary management champions identified the need for and importance of having other champions on board to lead and implement the process at different levels. According to Walter et al. (2011), the role of innovation champions within the organisation is vital for facilitating new ideas and technology-based innovations. The promotion and support of gains from innovations and new ideas are one of the key characteristics of having innovation champions, adding to the effectiveness of implementation (Miech et al. 2018). Therefore, as telerehabilitation was an innovation within clinical training, it was imperative to identify the enthusiastic and dedicated individuals within the three divisions to act as the champions to drive the process in various capacities. At this point, the telerehabilitation team (coordinating champions) was established to coordinate the whole process. In addition, a steering committee (curriculum development champions) was established to develop an ethical interprofessional telerehabilitation curriculum and develop learning outcomes and learning objectives for the student training module.

## ■ **Learning from the experts**

The knowledge from experts is known to be a valuable source of information with a wide range of research applications (Brennan et al. 2021; Caley et al. 2014). As telerehabilitation is still in the infancy stage in South Africa, a decision was made to reach out to experts involved in telerehabilitation to learn from their experiences. In addition, a narrative review was conducted. The main focus of the expert consultation and narrative review was to identify the core knowledge and skills needed for the successful implementation of telerehabilitation as part of undergraduate clinical training.

The following aspects such as determining readiness for telerehabilitation, effective communication using telerehabilitation, goal setting with clients, motivational interviewing, video essays for skills assessment, telerehabilitation and group therapy, basic information technology skills, understanding of the legislative context, including patient's privacy and safety, ethics and the use of telerehabilitation in a way that promotes equity and access were considered during the implementation process and provided guidance for the development of the telerehabilitation training module (Galpin et al. 2020; Signal et al. 2020).

## ■ **Understanding local contextual needs and barriers to the implementation of telerehabilitation through a readiness assessment**

The consultation of experts and a narrative review showed the importance of readiness among key stakeholders for the successful implementation of our innovation (Jennett et al. 2005). It was, therefore, important to identify core factors that may influence stakeholders' readiness to adopt telerehabilitation as a service delivery modality and assist rehabilitation students in executing the classroom knowledge into clinical practice via telerehabilitation technology.

Needs and barriers to the implementation of telerehabilitation were identified through the readiness assessment. These included the training of clinicians and supervisors, the need for designated space for telerehabilitation, lack of designated hardware and software, the cost of data for both clinicians and clients, and connectivity issues in remote rural service areas. These needs and barriers are in line with the common barriers to the adoption and implementation of telerehabilitation that have been identified in the literature. For example, Leochico and Valera (2020), Aloyuni et al. (2020) and Tyagi et al. (2018) identified the lack of technical knowledge and skills and lack of designated telerehabilitation platforms as common human, organisational and technical barriers to the adoption and implementation of telerehabilitation among service providers and service users.

Clinicians and clinical supervisors involved in student training were given access to the core training components of the student training module in order to address barriers associated with the lack of knowledge and skills observed during the implementation process. The technical supervisors provided training to students, academic staff (clinical supervisors) and clinicians in preparation for the delivery of telerehabilitation sessions. This training involved familiarising them with the hardware and the software and providing step-by-step guidelines and standard operating procedures (SOPs) to ensure quality-of-service delivery.

Issues related to the lack of designated space for telerehabilitation and designated hardware and software were addressed by establishing a telerehabilitation hub at SUN. The hub provides hardware, software and personnel, including a technical support team. The supervisors at the hub are trained in technical troubleshooting and provide technical assistance during telerehabilitation sessions. To ensure sustainability, the hardware and software at the hub are maintained by the personnel who ensure that all the devices used are regularly serviced and updated and comply with changing regulations.

Two aspects that were very important in the South African context were the ability to limit the use of data for calls and the learnability of software for

the clients. Therefore, to ensure the sustainability of the service, the software platforms selected for telerehabilitation have to be accessible in terms of costs and ease of use.

## ■ Addressing the training needs of students, clinicians, clinical educators and facilitators

As telerehabilitation was a relatively new intervention in the South African health care context, one of the key barriers that needed to be overcome was the need for staff and student training to ensure quality and competent services (Leochico et al. 2021). In addition, in 2020, there was little published evidence on the content and delivery methods of telemedicine and telehealth curricula (Hui et al. 2021). Danielson and Willgerodt (2018) recommended using theoretically grounded frameworks when implementing curriculum design and development for interprofessional learning. Constructive alignment and the hierarchical development of clinical skills were two theoretical frameworks that principally guided the development of the telerehabilitation curriculum (Brown, Bourke-Taylor & Williams 2012). Biggs' constructive alignment is based on the principle that when designing a new curriculum, it is important to begin first with what you want to achieve (Biggs 2012). These learning outcomes should indicate what the student is expected to know, do or value by the time they have engaged in all teaching and learning activities and should inform the methods of assessment chosen (Goode, Hegarty & Levy 2018). Telerehabilitation is a clinical skill that we expected students to be able to use in practice (Currie et al. 2022). Miller's pyramid was highly effective in guiding our thinking through the essential knowledge that students needed, what they needed to be able to do to facilitate a telerehabilitation session ethically and effectively and how the different programmes would implement telerehabilitation on the clinical training platform. Therefore, a programme included several teaching and learning methods, including simulation and peer-review (Currie et al. 2022). Our interprofessional approach was time efficient and produced a curriculum that was better than any of us could have developed independently.

The success of the telerehabilitation curriculum can also be ascribed to the building of social capital that already exists within the department (Danielson & Willgerodt 2018). The small team of academics from each of the three professions and the telerehabilitation coordinator knew each other prior to developing the curriculum and had a pre-existing network on which to build. In addition, the steering committee chair had previously worked closely with each of the other three team members on other projects. This resulted in increased cohesion and trust between team members. The frequency of meetings and their short duration meant that cohesion was maintained throughout the project without the project impacting too significantly on

participants' time. Team members were also carefully selected based on their professional knowledge and skills. As senior academics, they believed they had the internal resources to succeed. A clear and realistic goal to develop a telerehabilitation curriculum by the end of the academic year meant that the steering committee was focused during meetings, and ground rules and norms for working efficiently were easily established (Danielson & Wilbert 2018). The support of the telerehabilitation project team was also critical for ensuring that while the steering committee provided leadership in curriculum development, the time needed for developing the teaching and learning materials and setting up the online teaching platform was not the steering committee's responsibility. As with other collaborative curriculum design projects, we experienced an improvement in organisational culture because of our collaboration (Goode et al. 2018).

## ■ Limitations

Although the purpose of this study was to develop and integrate telerehabilitation in clinical training and service delivery, having input from all end-users (community rehabilitation workers, clients and clinical training supervisors) in terms of collaborating potential utility, preferences and challenges would provide valuable information about the acceptability, accessibility and sustainability of telerehabilitation. In addition, partnering more formally with the DoH in the Western Cape province of South Africa has the potential of recognising human and financial resources for telerehabilitation, developing a shared vision for clinical training and service delivery, and establishing leadership to promote a sustainable service.

## ■ Recommendations

Based on the experience of designing and implementing the telerehabilitation module in the undergraduate curriculum at SUN, the authors suggest recommendations for practice (Box 5.2).

**BOX 5.2:** Recommendations for practice.

### **When incorporating telerehabilitation into clinical training:**

The local contextual factors that might influence its adoption and implementation should be identified and considered during the training. This can be done through experts and the literature consultation and assessment of stakeholders' readiness for its adoption as a service delivery and clinical training modality within the local context.

Experts and literature consultation may provide valuable information regarding the key consideration of core knowledge and skills needed for the successful implementation of telerehabilitation.

A stakeholders' readiness assessment can provide local information about the telerehabilitation needs and barriers to its adoption and implementation, to be considered and addressed before telerehabilitation can be implemented.

## ■ Conclusion

Telerehabilitation is an evidence-based innovation that provides a safe option for the delivery of rehabilitation services and continued clinical training during the pandemic. It has great potential to strengthen and enhance rehabilitation service delivery in the local health system beyond the pandemic, especially for people with disabilities who are unable to access these much-needed services. We recommend that telerehabilitation be incorporated into clinical training. However, experts' opinions on key core knowledge and skills needed and the local contextual factors that might influence its adoption and implementation should be considered during the training. Approaching telerehabilitation training and integration in this way would provide guidelines for contextually relevant and sustainable telerehabilitation services across all clinical platforms.

## **THEME 3**

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# **Clinical education**



# The constructive learning elements of online clinical rotations that fostered practical learning: Occupational therapy students and clinical educators' perspectives

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## ■ Abstract

**Background:** The coronavirus disease of 2019 (COVID-19) pandemic gave rise to unparalleled circumstances that brought about unprecedented changes in the lives of individuals globally. The South African government enforced a nationwide lockdown that resulted in the temporary closure of non-essential sectors, which included the suspension of all educational activities. In response to the lockdown, higher education institutions (HEIs) were forced to adopt new methods of teaching. Conventional face-to-face (f2f) teaching and clinical rotations were therefore converted to online emergency remote teaching and learning (ERTL).

**Aim:** This study aimed to identify the constructive elements of the two online clinical rotations that took place during 2020 as experienced by Stellenbosch University's third- and fourth-year occupational therapy students and clinical educators, which fostered practical learning.

**Methods:** A collective case study was employed using a purposive total population sampling technique. Student participants' reflections and clinical educators' meeting transcriptions were used to obtain the perspectives of the

learning that took place from the 63 research participants. Content analysis, using an inductive analysis method, was utilised.

**Findings:** The constructive elements that contributed to the learning for the students were reflected in the following themes: (1) composites of the learning, (2) supervision and (3) active learning.

**Conclusion:** Elements of the online clinical rotation contributed to students' learning experience. These constructive elements have the potential to contribute to and facilitate a hybrid learning method that will allow for optimal clinical training to occur in the future.

## ■ Introduction

In 2020, the COVID-19 pandemic resulted in the temporary closure of non-essential sectors, businesses and educational institutions, as well as the suspension of educational activities for an indefinite period of time (Parliamentary Monitoring Group 2020). Higher education institutions were challenged to find solutions to successfully complete the academic year. Stellenbosch University (SUN) in South Africa transitioned from face-to-face on-campus teaching, learning and assessment to ERTL (Swart 2020). This included online teaching and learning, with fully remote solutions for instruction such as podcasts and video conferencing (Law 1991; Osorio Gómez & Duart 2012). This shift to teaching and learning via the online platform included the clinical training of occupational therapy (OT) students.

To graduate with a BA degree in OT in South Africa, a student is required to have completed 1 000 hours of clinical training at the end of the four-year programme (Health Professions Council of South Africa [HPCSA] 2020). In 2020, the health care students' clinical work rotation was one of the first activities on the clinical platform to be suspended under the State of Emergency. As clinical work experience cannot be postponed indefinitely, the World Federation of Occupational Therapists (WFOT) permitted 20%–30% of the required hours to be completed alternatively (i.e. without patient contact) provided that the focus remained on clinical learning (WFOT 2020). This resulted in a shift from traditional face-to-face methods of clinical training to online clinical training (Reinholz & French 2020).

## ■ Online clinical training in higher education in a low- to middle-income context

The adoption of online clinical training led to the modification of the roles and responsibilities of students and educators (Aziz et al. 2020), with the role of educators shifting from being the conveyors of information to being mentors,

coordinators and facilitators of learning (Hollis & Madill 2006; Oliver 2001; Xiong, Jiang & Mok 2020). Hollis and Madill (2006, p. 69) highlighted that 'active engagement in personally meaningful learning can be facilitated to different degrees in discussions and exercises', but they point out that learning still requires each student to engage individually.

Online learning within low- to middle-income (LMIC) contexts, such as Africa, can have the following benefits: a greater number of individuals that can be educated and accommodated within an online setting (Lederer, Lipson & Eisenberg 2021) and increased student access to information at any time and from any location regardless of challenges, given that students have access to the appropriate technologies and internet (Mpungose 2020). Further benefits include increased student motivation to learn when engaged successfully in online learning (Alsoufi et al. 2020; Harandi 2015; Oyedotun 2020).

Possible barriers to online learning that can be experienced in LMIC contexts include the 'digital divide' defined as the division between those who have access to the internet and computers and those who have not (Harandi 2015; Mpungose 2020; Van Deursen & Van Dijk 2019); political instability; cost; and a reliable connection to the internet and power supply (Alsoufi et al. 2020).

## ■ Online teaching and learning for clinical training of health professions students

The contagious nature of the pandemic forced hospitals to minimise non-essential staffing, resulting in student training being suspended (Reinholz & French 2020). This lack of direct involvement with patients could impede the development and consolidation of students' assessment, treatment and non-technical skills (Woolliscroft 2020).

Prior to the COVID-19 pandemic, many academic institutions worldwide promoted the use of a flipped classroom approach (asynchronous learning followed up with contact teaching session) and active online learning, which led to an easy transition to entirely online training of pre-clinical skills (Rose 2020). On the contrary, clinical training is much harder to move online (Dedeilia et al. 2020), although clinicians have been teaching from academic hospitals using live streaming (Mian & Khan 2020) and podcasts (Reinholz & French 2020). Despite the COVID-19 pandemic, the use of technology has enabled institutions to continue educational programmes with a hybrid approach.

## ■ The use of a hybrid approach for teaching and learning clinical skills

A hybrid approach is a combination of face-to-face interactions and technologically mediated interactions between students, educators and

learning resources (Bliuc et al. 2012). There is evidence to suggest that a hybrid approach to learning enhances the interaction between peers, students and lecturers, and it may also address higher-order learning needs. This is because the combination of online learning and learning in a face-to-face environment is less likely to allow for rote learning and simple solutions (Hollis & Madill 2006). It is, however, necessary to consider that a hybrid learning environment embodies more than just the physical space, and there are numerous factors to consider that may influence learning (Frenzel, Pekrun & Goetz 2007). When designing online content, educators must be organised and intentional, with a focus on active engagement and purposeful interactions (Bliuc et al. 2012; Gerbic 2011).

## ■ Factors that influence learning

Intrapersonal, interpersonal, environmental, and teaching and learning methods are all factors within the learning context that may impact learning (Frenzel et al. 2007). Intrapersonal skills are defined as one's ability to know and manage oneself, which includes embracing one's self-awareness, assertiveness, self-regard, independence and self-actualisation (Baron 2006). Knowles's theory of adult teaching and learning identifies self-worth and autonomy as characteristics a student learner might possess to foster their learning experience (Clapper 2010; Hanrahan 1998; Knowles 1979). Clapper (2010) suggested that self-awareness could be increased through students writing a reflection that enables them to reflect critically on their own learning experiences. Furthermore, educators need to be aware that students might have multiple responsibilities and demands to manage, but as long as the learning tasks are deemed essential and meaningful students are willing to invest maximum effort (Baron 2006; Hanrahan 1998; Knowles 1979). Students' attitudes also have a major impact on their approach towards learning (Rius-Ottenheim 2012). Having positive expectations about the future allows them to see their goals as feasible, causing them to persist in achieving these goals (Rius-Ottenheim 2012).

Students' healthy functioning, development and achievement of educational goals are significantly linked to their formation of interpersonal relationships, specifically their primary relationships with peers and educators (Zandvliet et al. 2014). Peer relationships have a remarkable impact on students' psychological well-being, health, academic subject preferences and academic development (Boda et al. 2020; Filade et al. 2019). Social support has been found to be a key factor contributing to the success of students at the university level (Boda et al. 2020; Filade et al. 2019; Stadtfeld et al. 2019). Students engage in learning with one another, which encourages and implements the sharing of knowledge, experiences and ideas that are mutually beneficial (Topping & Ehly 2001). They may also serve as positive role models for each other (Filade et al. 2019).

Roberts (2008) found that friendship among students is important to foster clinical learning. Comradeship with fellow students is seen as an important coping mechanism for students who are placed on a clinical platform, as friendships aid in supporting them and contributing to their learning. When learning practical clinical skills, students aid each other in refining clinical skills through demonstration and practice (Roberts 2008). Negative peer influence can adversely impact academic performance (Filade et al. 2019). Bullying among peers may also contribute to students discontinuing their studies prematurely (Bernardo et al. 2020).

The role of the educator is influential in students' academic and non-academic development (Martin, Marsh & McInerney 2009). The student-educator interpersonal relationship is a dynamic, interactive relationship that is considered the most effective factor in fostering successful clinical education (Levett-Jones & Lathlean 2008; Warrender 1990). The educator's role within this relationship is to facilitate and promote a constructive learning environment for students' professional development by establishing themselves as professional role models and by teaching the students practical skills (Warrender 1990). It is suggested that the ideal student-educator relationship is characterised by qualities such as flexibility, emotional investment, interdependence, mutuality, collaboration and support for one's identity (Branch & Paranjape 2002; Kern et al. 2005). Positive student-educator relationships are important for good academic performance, enhanced motivation and improved commitment to studies, and they greatly reduce drop-out rates (Hagenauer & Volet 2014). On the contrary, a poor educator-student relationship can result in the student experiencing high levels of anxiety, a feeling of disconnectedness and uncertainty regarding their role (Said, Rogayah & Hafizah 2009; Thompson & Wheeler 2010).

The 'learning environment is an interactive network of forces within the teaching and learning activities that influence students' learning outcomes' (Said et al. 2009, p. 16). A good learning environment addresses the physical, intellectual and emotional aspects of a student in order to create a safe and supportive space that is sensitive to the unique needs, values and characteristics of a student and is conducive to optimal learning (Chan 1996; Thompson & Wheeler 2010). According to Maudsley (2001), constructive learning is most often associated with a learning environment that is supportive of the students, understands their needs and wants, promotes an inquisitive atmosphere among students and is marked by awareness and sensitivity to different cultures, ethnicities and genders. Clinical settings play a crucial role in developing a student's practical skills (Vogel & Harendza 2016). Learning within the clinical setting makes it necessary for clinicians to be the link between the tertiary educational setting and the workplace and they form a crucial part of the environmental factors that could hinder or facilitate learning (Bannister et al. 2015).

Two fundamental methods of teaching that are commonly used within clinical settings are feedback and reflection (Branch & Paranjape 2002). Feedback is found to be an effective learning method as it reinforces good habits and corrects flawed behaviour (Ramani & Krackov 2012). Branch and Paranjape (2002) referred to three categories of feedback, namely, brief feedback (i.e. feedback during or immediately after the completion of the task), formal feedback (i.e. specific time is set aside to give and receive feedback) and major feedback (i.e. feedback scheduled in the middle of a learning experience). Reflection is beneficial to the learning experience of the student as it allows for the assimilation and reworking of knowledge, skills and attitudes and is based on previous life experience and within an individual's cognitive framework (Branch & Paranjape 2002). Reflection results in a student's moral, personal, psychological, emotional and cognitive growth and is therefore a fundamental method of learning (Solomon 2014). Using a combination of teaching and learning methods has been found to optimise the teaching of practical skills to health care students as it encourages adaptability and flexibility in students and prevents them from becoming uninterested and desensitised to a method (Vaughn & Baker 2001). Teaching and learning methods include self-study and using multimedia as well as a structured programme that facilitates active participation of the students while providing personal feedback (Branch & Paranjape 2002). Additional teaching methods include structured skill training, discussion, demonstration, simulation and observation of peers and teachers, problem-based learning, a case-based method of teaching and context-based methods of learning (Darling-Hammond, Friedlaender & Snyder 2014; Jonassen & Hernández-Sarrano 2019; Shafaroodi et al. 2017).

It is common practice for OT educators to use a case-based method of teaching to prepare students for engaging in clinical work. It requires students to interpret information, reflect critically on the acquired knowledge and use this knowledge in novel situations to solve problems, thus developing their clinical reasoning skills (Henderson, Coppard & Qi 2017; Jonassen & Hernández-Sarrano 2019). Aspects incorporated into cases to promote learning include authenticity, relevance to the learners' needs or goals, richness in content and context, and connections between theory and practice. Case studies can be combined with a variety of learning activities (Henderson et al. 2017).

## ■ Teaching and learning methods for the clinical training of occupational therapy students in the context of Stellenbosch University

Online clinical rotations took place in 2020, comprising two five-week blocks for third-year students and two six-week blocks for fourth-year students. The focus included structured case-based learning, where students engaged with

previously written client case studies relating to the client population typical of the clinical placement area they had originally been allocated to before the COVID-19 pandemic. As students were unable to engage with clients, a specific focus of online clinical rotations was on the development of students' clinical reasoning skills, enhancing their application of the OT process and improving the graduate attribute of communication (e.g. presentation of client case studies). Students had the opportunity to engage with the different components of a case study, one section at a time, by completing daily tasks specifically planned by the OT division. The division equipped the students with multiple resources to aid them in their understanding and completion of the online tasks as comprehensively as possible. Students followed a structured weekly programme. The academic activities that students were expected to complete included listening to podcasts, completing quizzes, peer evaluation of case studies and completing their own written work based on the newfound knowledge they had acquired following their engagement with the online resources provided. After receiving daily feedback, students had the opportunity to redo the specific section of the OT process to ensure that optimal learning occurred. The students also completed weekly reflections focusing on their challenges and triumphs throughout the week and their understanding of their learning experience. Accredited clinical educators (i.e. occupational therapists appointed by SUN to facilitate teaching in clinical spaces) were assigned to students to offer online clinical guidance and to assess students' clinical competence in OT practice. Clinical educators attended (voluntary) weekly meetings to reflect and support each other to guide students.

## ■ Research question

The occurrence of online clinical training lasting longer than a week or two is unprecedented in the OT profession. These longer online clinical rotations, as part of the exception granted by WFOT, cannot be repeated in the same format, but they might hold constructive learning elements that can be included in future clinical training. The research question that arose was: What are the constructive learning elements experienced by the SUN's third- and fourth-year OT students and their clinical educators during the online clinical rotations that took place during 2020?

In the context of this study, 'constructive learning elements' are operationalised as the essential components that enhanced or improved the learning experience and promoted further development for OT students throughout the online clinical rotations during the COVID-19 pandemic.

## ■ Aim and objectives

The aim of this research was thus to explore the potential constructive learning elements of the online clinical rotations that took place during 2020 from the



perspectives of SUN's third- and fourth-year OT students and their clinical educators.

The objectives of the study were thus to identify:

- the structural components of the online clinical rotations (e.g. weekly timetable)
- the constructive learning elements within the third- and fourth-year OT student and clinical educator's relationship
- the online clinical activities (e.g. peer learning activities) that contributed to the practical learning experience of the third- and fourth-year OT students.

## ■ Methods

### ■ Design

This study used a collective case study design (Crowe et al. 2011) to develop a holistic understanding of the constructive learning elements and to allow for a comparison between the three cases as depicted in Table 6.1. The key features by which a case study is defined include its focus on a specific phenomenon (i.e. the constructive learning elements) and its in-depth description and interpretation within context using multiple sources of information (i.e. student reflections and transcripts of clinical educator support meetings) (Crowe et al. 2011).

### ■ Sampling

The selection criteria for the purposive sampling were that a participant needed to have been registered as a third- or fourth-year OT student during the 2020 academic year at SUN or should have been a clinical educator to the aforementioned students during the online clinical rotations and attended the weekly meetings offered to the educators.

In the case of the students, individuals were excluded if they did not complete weekly reflections or, in the case of the clinical educators, if they did not attend the weekly meetings. From a total of 29 clinical educators that attended the meetings, 21 provided their informed consent, along with 14 of the 44 fourth-year students and 28 of the 48 third-year students. As the researchers formed a part of the study population, an emic perspective was adopted, as discussed in the section on trustworthiness and rigour. Prior to the commencement of the online clinical rotations, the third-year OT students of 2020 only had exposure to one face-to-face clinical experience, whereas the fourth-year OT students had exposure to four face-to-face clinical experiences – this difference in experience was the reason the students were separated into different cases.



## ■ Participant recruitment, data collection and management process

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional research committee and with the *Declaration of Helsinki of 1964* (WMA 1964) and its later amendments or comparable ethical standards. Participant recruitment commenced once institutional and ethical approval from the Human Research Ethics Committee of SUN (#U20/11/101) was obtained.

Prior to accessing the existing data (weekly reflections and meeting transcripts), written informed consent was obtained. The anonymised data were uploaded to secure folders on Microsoft Teams. Each participant was given a code, as seen in Table 6.1.

## ■ Data analysis

An inductive process using the content analysis method of Thomas (2006) was applied within each case and across cases to allow for a unified description of the constructive learning elements with the following steps:

1. The data collected from the online clinical rotations were divided into three case studies to be analysed.
2. The researchers divided themselves into pairs working on a case for analysis and familiarised themselves with the data.
3. The pairs then separately analysed the data from their case for the identification of codes.
4. Each member of a pair then compared their findings with their partner's findings to reach an agreement and to minimise potential biases.
5. Once data codes were selected by both members within a pair as significant to the research, data codes were preliminarily categorised. Sub-categories were used to organise data and to link similar terms.
6. The researchers merged the data categories into themes.
7. A cross-case analysis was then undertaken on a shared document. This included a process of comparing and merging salient categories of each case. The sub-categories and categories that were consistent across cases were then grouped into themes, resulting in a unified description of categories and themes across the three cases.

**TABLE 6.1:** Cases included in the research.

Case	Case description	Code	Data source
1.	Third-year OT students	P	Weekly written reflections
2.	Fourth-year OT students	Q	Weekly written reflections
3.	Clinical educators	T	Transcriptions of weekly educators' support meetings

Key: OT, occupational therapy.

## ■ Ethical considerations

Respect and autonomy were ensured by communicating clearly to the participants their choice to participate in the research study and what participation entails. Participants could ask questions, and data were anonymised to ensure confidentiality.

Justice was ensured by holding all the participants' information at the same standard of confidentiality (Hocking 2017) and by ensuring that information is portrayed honestly and truthfully and not according to the researchers' interpretation.

## ■ Trustworthiness and rigour

The application of Krefting's (1991) strategies of credibility, transferability, dependability and confirmability contributed to the trustworthiness and rigour of the research. It was applied as described next.

Member checking was done by contacting all participants via email to determine whether the findings accurately represented their experience. Peer checking was done through multiple researchers reading the same reflections and meeting transcripts and comparing their analyses throughout. Triangulation of data and investigators was achieved by using three data sources for findings and investigators doubling up on analysis steps. A thick description of the study context and an audit trail in the form of a detailed description of the research process contributed to the dependability. All researchers practised reflexivity by keeping a journal for the duration of the study while also having regular group discussions about their own personal biases and experiences.

## ■ Findings

The aim of this research was to explore the potential constructive learning elements of the online clinical rotations that took place in 2020. Across the three cases, three themes emerged, and these themes will be discussed with the categories and sub-categories below.

### ■ Theme 1: Composites of online academic learning activities

This theme encapsulates the different composites of the online academic learning activities and how they aided the students in their clinical learning while they completed the different learning tasks. This theme (reflected in Table 6.2) comprised three categories that describe how (1) the structure of online clinical rotations, (2) the academic resources provided by the OT division and (3) the insight into the OT process and clinical reasoning skills developed through participation in the required activities.

**TABLE 6.2:** Quotations in support of the categories and sub-categories of Theme 1: Composites of online academic learning activities.

Categories	Sub-categories	Quotes
<b>1.1 Structure of online clinical rotations</b>  This category focuses on the structures applied and specifically the composition of the different clinical academic activities	a) Layout of online clinical rotations	'The fact that everything for that specific week is uploaded in advance made me feel more at ease as I could see what will be expected of me for that week.' (P22, 2020)  'The structure of this online block was useful in taking one section at a time and properly engaging with integrating the information as opposed to usual clinical blocks where I was also very focused on the written requirements instead of integrating the knowledge with the practical component.' (Q11, 2020)  'The end products that they handed in to me were actually of higher standard as previous years, because I think they had such clear guidelines [...] the structure of this block contributed quite a lot to its success.' (T23, 2020)
	b) Peer assessment	'I found it good to be able to evaluate the task before I needed to do it myself, to be able to see problems that I may have encountered and know how to not make those mistakes when it came to setting up my own programme.' (P25, 2020)  'Marking another person's work always makes me reconsider the quality of my own work. [...] If someone else were to read it, would they understand what I am aiming for, the rationale behind my planning etc.?' (Q7, 2020)  '[...] the marking and the evaluation of the paper case study treatment plan and treatment programmes really gave them a different perspective in terms of somebody else reading their work and how specific they need to be to make sure that the next person actually understands what they're intending to mean with their planning.' (T11, 2020)
	c) Workload inherent to tasks	'This current way of learning has allowed me more time to think and use the learning experience optimally as I do not feel exhausted or stressed [...] I found this block to be at a pace that I could fully take in what I was learning [...]' (P27, 2020)  '[...] I actually had time to read academic texts like textbooks and articles to complement my (very limited) knowledge and class notes - which is of course how it should always be, but is unfortunately just not the reality during in-person blocks.' (Q7, 2020)  '[...] the fact that they now have more time to analyse and to read up, they are doing the tasks more comprehensively.' (T2, 2020)
<b>1.2 Academic resources</b>  This category focuses on the online academic resources provided to all students	a) Podcasts	'The podcasts were extremely helpful because not only did it provide you with information on the specific topic of the task for the day, but it also helped me to understand what exactly does this entail in terms of information, layout and order. This helped me a lot in terms of sparking my thinking and directing it in a specific way so that you don't go off track and eventually come to a conclusion.' (P22, 2020)  '[...] was a helpful experience given that it had concrete and very applicable examples for me to follow.' (Q8, 2020)  '[...] are excellent especially because they watch it in the morning and then move onto the task, and I think that it is very valuable that it is fresh in their memory and yes [...] that one is able to give feedback on it and delve into it for a while.' (T4, 2020)
	b) Written guidelines and templates	'[...] helped me to form a mental image of [...] and get an understanding of the circumstances the client lives in. This helped me to know which assessments would be appropriate, available, etc. [...]' (P19, 2020)  'Looking at the marking criteria gave me a better understanding of what should be included [...] It helped me to draw up a structure for what information I needed to include.' (Q8, 2020)

Table 6.2 continues on next page→

**TABLE 6.2 (cont.):** Quotations in support of the categories and sub-categories of Theme 1: Composites of online academic learning activities.

Categories	Sub-categories	Quotes
<b>1.3 Insight into OT practice</b>  This category focuses on how students developed awareness and insight into the OT theory and practice	a) Clinical reasoning	'I feel that this was the ideal opportunity for me to improve on my clinical reasoning skills on paper (in my case study) as this was my biggest downfall during my previous block [...] I am truly thankful that we had the opportunity to Zoom and only focus on this part of the OT process as (I) believe that it had lay down a firm basis for me to work from in the future and ultimately influences how I will approach my blocks in the future.' (P22, 2020)  'Before this block I felt like I was stuck in a rut with regards to my paperwork and how to structure my own learning when it comes to paperwork. I feel that things that were blurry have been well explained now, and I understand their significance and how they are to help my reasoning.' (Q2, 2020)
	b) OT process	'[...] I've experienced how I was able to make links between content that I wasn't able to do in my previous blocks. I feel like I am able to navigate the OT process with a lot more ease and confidence now.' (P21, 2020)  'This process allowed me to take a step back and understand how important each step is and how one weakness in the OT process can cause a collapse in the entire intervention.' (Q4, 2020)

Key: OT, occupational therapy.

**TABLE 6.3:** Quotations in support of the categories and sub-categories of Theme 2: Supervision.

Categories	Sub-categories	Quotes
<b>2.1 Acknowledgement of learning needs</b>  This category highlights the importance of the acknowledgement of students' learning needs by their educators and the constructive components contributing to their learning during their clinical rotations	a) Emotional support	'I was very thankful that my supervisor contacted me. She made it clear that she was willing to navigate these uncertain times together and to the best of her abilities.' (P19, 2020)  'One thing that helped me was that we had a Zoom meeting at the beginning of the week in which I told students that I was also very nervous and that we would take it day by day. I can truly see in their reflections that the fact that I aligned myself with them or them with myself had an impact to deal with their emotions immediately [...]' (T20, 2020)
	b) Academic support	'[...] if I had not received help from my supervisor or practised formulating aims, I probably would have made the same little mistakes in my treatment plan [...]' (P12, 2020)  'I tried to rectify it and understand what our supervisor wanted from us. I loved the fact that she was open to discuss with us and help us with the matter. [...] after meeting with my supervisor it was so much easier for me to set aims.' (Q9, 2020)  'I have told [...] students the same thing ten times, but to explain it to everyone with the same passion and hopefully bring each of them to a new level of understanding whatever that level is for them, for each of them is.' (T20, 2020)

Table 6.3 continues on the next page→

**TABLE 6.3 (cont.):** Quotations in support of the categories and sub-categories of Theme 2: Supervision.

Categories	Sub-categories	Quotes
<b>2.2 Feedback mechanisms</b>  This category highlights the importance of how the clinical educators' inputs and initiatives regarding feedback contributed to the learning of the students	a) Characteristics of feedback	'I felt like the feedback I had received was clearly stated which helped me to understand what exactly I needed to re-formulate and change to better my understanding as well as my work standards that are expected from the supervisor.' (P7, 2020)  'I am fully aware that, even with my best efforts, once again, these documents would not have been nearly as comprehensive and logical, had I not received such constructive feedback.' (Q8, 2020)  '[...] what worked really well for me this week is that I immediately give the students their work and provide them with their feedback as soon as possible [...]' (T8, 2020)
	b) Discussion after written feedback	'After having a conversation with my supervisor, I got a better understanding about the things I did wrong and especially where I went wrong.' (P10, 2020)  'Having had the tutorial last Friday made easing into this week so much easier as I already had a clear idea of what my tasks would entail, based on the wonderful feedback and brainstorming ideas that arose from the discussions.' (Q8, 2020)  '[...] I think what is really striking for me, is how in these blocks more than any other blocks is how the students really utilise their written feedback and the discussions that we have with them.' (T13, 2020)
	c) Spin-off of feedback	'The most valuable source of learning was definitely the feedback that I received over the course of the clinical block [...]' (P28, 2020)  '[...] I was able to look at my work, the feedback provided and identify the gaps I had and incorporate the supervisors feedback which was incredibly beneficial, as I now have a better understanding of the formulation of a treatment plan as a whole.' (Q3, 2020)  'I think it was also important for me to be able to see if they did understand the feedback they received on their previous case, because their evaluation now of the new (case) I can see how my comments come out of it and it is nice for me too to see that they not only use what I have said, but understand what I have said to them.' (T5, 2020)
<b>2.3 Supplementary learning</b>  This category focuses on the additional learning opportunities and materials made available to the students. These opportunities were tailor-made by educators for students according to specific needs.	a) Additional learning opportunities	'A positive about the week was the meetings we had, which I believe was a different way of learning that I experienced this week. I had the opportunity to listen to different diagnoses and some examples of how to treat different symptoms that other patients experienced. We also spoke about possible activities that go with treatment, and I believe that I learnt a lot about my choice of activity.' (P10, 2020)  '[...] I also told them to please do an example and send it to me and then I'd tell them if they were on the right track or not, rather than me leaving it and then in the evening when I get it is completely wrong.' (T22, 2020)
	b) Additional learning materials	'Reading the articles sent by my supervisor was helpful.' (P19, 2020)  'Sometimes during the WhatsApp calls I demonstrated and illustrated things to them, which they found interesting [...] they have a need for it [...] to see things [...] not just to read about it.' (T28, 2020)

**TABLE 6.4:** Quotations in support of the categories and sub-categories of Theme 3: Active learning.

Categories	Sub-categories	Quotes
<p><b>3.1 Reflective journaling</b></p> <p>This category portrays reflective journaling as an effective learning strategy that enabled students to improve their work performance as it encouraged engagement with their work efforts and feedback received on a deeper level. Reflective journaling also helped students to test the validity of their ideas, or express their emotions.</p>		<p>'I found this reflection very useful. It encouraged me to engage with the feedback that was given to me, to critically evaluate what I can improve on, to remember what I did well, and to cement all this knowledge into my mind to remember for the future.' (P3, 2020)</p> <p>'I think in terms of my personal growth, the greatest lessons I have learnt, and realisations have come to have been through the weekly reflections [...] Truly reflecting requires effort, but I have seen the benefit it can bring both for my professional and personal development.' (Q7, 2020)</p> <p>'[...] I think that the reflection was the most important thing for me to obtain information of what is going on in their heads and how they reason.' (T15, 2020)</p>
<p><b>3.2 Strategies to enhance learning</b></p> <p>This category looks at the different approaches and strategies adopted by the students to facilitate and improve learning</p>	<p>a) Organisational strategies</p> <p>b) Peer support</p> <p>c) Occupational balance and stress management</p> <p>d) Online resources</p>	<p>'I also made more in detail timetables which allowed for breaks. These strategies help really helped throughout the block in optimising my learning as much as possible to reduce anxiety and allow me to produce a standard of work that I was happy with.' (P2, 2020)</p> <p>'I started making notes on what I should do. This really helped to structure my thoughts. I also really started to rely on my diary last week to keep track of what I need to do [...] Structure enables me to think clearly and know what I should do next but if I do not have structure I struggle to think clearly and these effects the quality of my work. I have learnt some coping mechanisms.' (Q6, 2020)</p> <p>'I also communicated with my clinical partner daily to bounce ideas off each other and check in with each other's progress and well-being. I found it very insightful to hear someone else's ideas and perspectives on the task at hand, through the dialogue we learn about each other's strengths and weaknesses and can teach/guide each other in our tasks.' (P26, 2020)</p> <p>'[...] it was a valuable experience to talk to people who are going through the same things as us, not exactly but the process. We are in a unique situation and facing different pressures to our classmates in other blocks, so helping each other and motivating each other makes more sense because I feel we are experiencing similar feelings and emotions.' (Q5, 2020)</p> <p>'Being in a healthier mental space and giving my week more structure, has made a huge difference to my work ethic, which has, in turn, allowed me to better engage with the tasks for the week.' (P27, 2020)</p> <p>'I have had to learn to respect my health and well-being when it comes to sleep as this has been the primary negative influence on the quality of my written work in the past.' (Q10, 2020)</p> <p>'I made sure that I looked at additional sources to help me in improving the quality of my work and getting more information in order to make the best decision.' (P13, 2020)</p> <p>'All the articles were so interesting to read, and they were so insightful. They gave me perspective on so many concepts.' (Q2, 2020)</p>

## ■ Theme 2: Supervision

This theme (see Table 6.3) reflects the nuances of the student-educator interactions during the online clinical rotations. The relationships between the educators' inputs and the students' responses are described in three different categories, namely, the acknowledgement of learning needs, feedback mechanisms and supplementary learning.

## ■ Theme 3: Active learning

This theme (see Table 6.4) focuses on the clinical learning activities in which the students actively engaged and that facilitated and enhanced the students' learning. It includes the categories of (1) reflective journaling and (2) strategies to enhance learning.

The similarities between the cases are noteworthy. The themes and categories reflect a shared perspective on the constructive elements of online learning. Differences are mostly evident in sub-categories. This will be expanded upon in the discussion.

## ■ Discussion

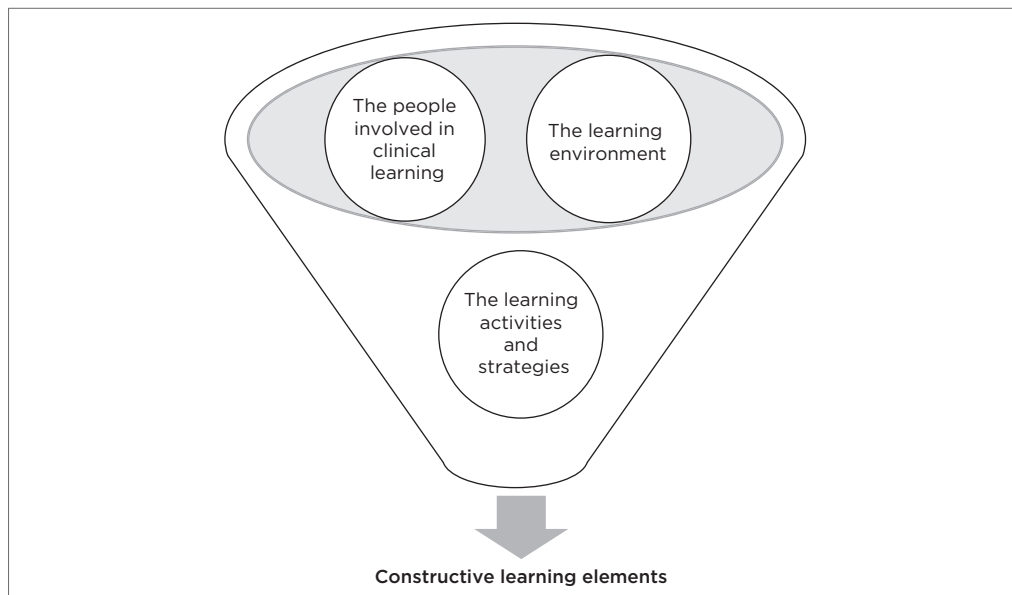
This study aimed to identify the constructive elements of online clinical rotations. The findings are discussed in relation to the existing body of literature, according to the following overarching learning constructs (Figure 6.1):

- The people involved in clinical learning
- The learning environment
- The learning activities and strategies

The findings of the study in relation to the corresponding learning constructs are summarised in Table 6.5.

## ■ Clinical learning

Within the online clinical rotations, there were a multitude of opportunities for students to learn from one another and their educator. Peer assessment was a common denominator seen across the three cases. Students found that comparing their work with that of a peer enabled them to identify the differences and disparities within their own work. This contributed to the students' awareness and enhancement of the comprehensiveness of their own work. The clinical educators deemed the peer-evaluated tasks as valuable to determine students' insight. The literature supports the notion that when students are associated with hardworking peers, the peer serves



Source: Authors' own work.

**FIGURE 6.1:** The combination of learning constructs that encompasses constructive learning elements.

**TABLE 6.5:** Summary of the relation between learning constructs and sub-categories.

Themes	Clinical learning	The learning environment	The learning activities and strategies
Composites of online academic learning activities	Peer assessment Clinical reasoning	Layout of online clinical activities	Podcasts Written guidelines and templates Workload inherent to tasks OT process
Supervision	Characteristics of feedback Discussion after written feedback Spin-off of feedback Emotional support Academic support	-	Additional learning opportunities Additional learning materials
Active learning	Peer support Occupational balance and stress management	Online resources	Reflective journaling <sup>†</sup> Organisational strategies

Key: OT, occupational therapy.

<sup>†</sup>Category.

as a positive role model for the other, motivating them to produce a higher standard or quality of work (Filade et al. 2019).

Similarly, peer support was another common theme. Students utilised peers to promote their own learning by sharing ideas, clarifying uncertainties and observing different perspectives. Students provided each other with emotional support, which assisted them in feeling less anxious and therefore improved their



learning experience. A positive peer relationship has been shown to improve a student's psychological well-being, health and academic success (Boda et al. 2020; Filade et al. 2019; Knowles 1979), while a negative peer relationship results in a decrease in students' academic performance (Stadtfeld et al. 2019).

Cases one and two identified the use of case-based learning as facilitating students' clinical reasoning and insight into the OT process. It is recognised that case-based learning requires students to interpret information, critically reflect on the knowledge they have acquired and use this knowledge to solve problems (Jonassen & Hernández-Sarrano 2019).

The students and educators independently identified the educator–student interactions as being beneficial to the learning experience. The specified constructive elements within this relationship include the acknowledgement of learning needs, the educator feedback and the supplementary learning generated by educators. The importance of the educator–student interaction is echoed in the literature as the educators' ability to create a positive learning environment by providing direct help or guidance and learning opportunities to challenge students to expand their knowledge and abilities (Mulholland, Derald & Roy 2006).

Educators' acknowledgement of students' learning needs was identified in all three cases as positively contributing to the students' learning experience. Emotional support and academic support were highlighted for the positive impact they had on the students' optimal learning and successful task completion. This finding reflects the central role that the student-educator relationship plays in the success of students, specifically in clinical education (Levett-Jones & Lathlean 2008; Warrender 1990).

Feedback mechanisms between students and educators are deemed an effective learning method that reinforces good habits and corrects flawed behaviour (Ramani & Krackov 2012). The benefit of feedback mechanisms was identified as a major element in all three cases as a means of fostering the students' learning. Feedback remains one of the optimal methods by which to teach practical skills to health care students (Vogel & Harendza 2016) as it has been found to facilitate learning by providing direct help and guidance (Mulholland et al. 2006).

The characteristics of feedback identified in all cases as fostering the learning of the students included detailed, comprehensive, clear, immediate and constructive feedback. This played an important role in optimising their learning experience and provided the students with the necessary clarity and understanding while navigating the different tasks as set out in the structure of the online clinical rotation. The implementation of immediate feedback fostered the learning of the students as it opened the floor for continuous communication between the student and the educator, as seen in Branch and Paranjape (2002). This provided the students with immediate feedback on

their own progress and highlighted the areas for improvement. The students viewed the implementation of constructive feedback as being very valuable, uplifting and encouraging. From the students' perspective, the essence of constructive feedback was not aimed at criticising their lack of knowledge or understanding but rather at providing them with the necessary guidance and assistance to perform optimally in the learning process. Constructive learning is associated with people in the learning environment who are supportive of the students, understand the needs and wants of the students, promote an inquisitive atmosphere among participants and stress the importance of a respectful and supportive environment that allows the students to feel validated and empowered to share their ideas (Maudsley 2001).

All three cases emphasised the importance of a discussion between the student and the educator following the task feedback. The students felt that the discussion gave them more clarity and insight and helped them develop their critical thinking. Educators saw these discussions as beneficial in ensuring that the students actively engaged with the feedback. Discussions are an important teaching method that fosters the development of practical skills and clinical reasoning abilities more effectively (Darling-Hammond et al. 2014; Jonassen & Hernández-Sarrano 2019; Shafaroodi et al. 2017).

In looking at the spin-off of educator feedback, the way in which the educator feedback affected the students' academic performance and overall well-being was explored. The students identified that the provision of educator feedback had reduced their anxiety, reassured them about their abilities and provided them with the necessary clarity and understanding of the OT process, whereas the educators identified how the active engagement of students in the implementation of the feedback had played a central role in facilitating the students' learning during consecutive tasks. The relationship between student and educator, if perceived as being positive in nature, contributes to good academic performance, enhanced motivation and improved commitment to studies (Hagenauer & Volet 2014).

Another common theme among the students was that of occupational balance and stress management. Many students reported that online clinical rotation afforded them the opportunity and time to practise an occupationally balanced lifestyle, which consequentially improved their mental well-being and work performance. For example, some students would incorporate active breaks into their workdays, and others would ensure they got adequate rest. Many students found that the more organised and prepared they were for the daily tasks, the less stress they experienced. Students would also attempt to adopt a more positive attitude to promote a sense of calmness. Online learning affords students more flexibility and freedom with regard to time so that they can rework and engage with their schedule in a manner that works for them (Hollis & Madill 2006). Students also began to introduce their own coping mechanisms to manage stress and anxiety. Students with effective coping

mechanisms are more optimistic and are able to deal with adversity in a more effective manner (Rius-Ottenheim 2012).

## ■ The learning environment

The learning environment of the online clinical rotation encompassed both the physical space in which the learning took place and the structure implemented by the OT division to optimise the learning for students within their individual learning space.

All cases identified the online clinical structure and layout of activities implemented by the OT division as a facilitator of students' learning in multiple ways. Elements that were incorporated, such as a timetable and detailed marking sheets, provided students with an opportunity to exercise their autonomy over their time management and learning. Self-worth and autonomy are important factors for students to experience in their learning environment to allow for optimal learning (Clapper 2010; Hanrahan 1998; Knowles 1979). The structure and the defined deadlines reduced anxiety because of the clearly defined academic expectations. It motivated students to work systematically and to pace themselves. The literature reports that factors positively influencing the learning process include having time constraints, clear objectives and expectations, as well as specifically allocated time for reflection and discussion (Ramani & Leinster 2008). This confirms what was found in the study reported in this chapter.

All cases identified the structure and sequencing of tasks as facilitating learning. Students appreciated having an example of the task expected of them and the time to focus systematically on a specific aspect of the OT process. It ensured a thorough understanding before continuing to the next section. Kaput (2018) suggested that to prevent gaps within students' learning, they should only be permitted to progress their learning once they have mastered the current concepts. Kaput's view supports the findings of this study.

The physical environment within which learning took place was an important element identified by students. They identified their home environment, in which the online learning occurred, as either constructive or a hindrance to their learning. The learning environment is an interactive network of forces within which the teaching and learning activities that influence students' learning outcomes take place (Kern et al. 2005).

Most students noted that completing their clinical rotations in their home environment was beneficial, as their home environment allowed for a sense of familiarity and, in some cases, offered familial or peer support, reducing feelings of isolation. An environment that is conducive to learning is one that the students experience as being safe and supportive, and this increases student achievement and success (Bannister et al. 2015; Chan 1996; Thompson

& Wheeler 2010). However, disadvantages of working from home were also found. They were attributed to distractions within the physical environment. Thus, the constructive contribution of the home environment to the learning experiences of students and educators is unique to each individual.

## ■ The learning activities and strategies

The online clinical rotation included many learning activities prescribed by the OT division, as well as individual learning opportunities that the students and educators took upon themselves to introduce.

Within all three cases, it was identified that the academic resources provided by the OT division were a constructive component of the learning experience. Participants reported that the academic resources aided them when they were struggling or uncertain about how to proceed. This echoes the finding by Vogel and Harendza (2016) that a combination of multimedia resources and a structured programme optimises student education. It allowed the students to prepare and complete the online academic tasks daily, as they were able to refer to these resources, especially the podcasts, when needed. The podcasts were deemed particularly valuable in their learning experience, as they allowed for a higher level of comprehension of their individual case study. Case-based learning offered authentic and content-rich individual cases from which students could learn. Henderson et al. (2017) supported the view that case-based learning is valuable in developing clinical reasoning skills.

Another common facilitating factor that was identified was the extent of the workload of the online clinical rotations. The manageable workload allowed students the time to acquire supplementary resources from their educators or to spend more time on each academic task, which enabled them to evaluate their own work prior to submission. This is confirmed in the literature as students in a study by Reis, Faser and Davis (2015) reported having more time during online classes to engage in tasks at their own pace.

It was evident that students believed the reflective journals were a constructive element in their learning experience as the journaling enabled them to consolidate their learning. It gave them the opportunity to develop insight into their own strengths and limitations, enabled them to enhance their work performance and forced them to evaluate the effectiveness of their work habits and strategies. The clinical educators echoed this view as they found that the reflective journaling process allowed the students to reflect upon the soundness and reasoning in their work. Similarly, Mengistie (2019) reported that reflection is fundamental to learning as it is commonly used to develop students' skills and to promote personal, emotional and cognitive growth. Reflection is also beneficial to the students' learning (Branch & Paranjape 2002). It allowed educators to monitor the progress of the students

and identify their needs to provide more assistance. Weekly reflective journals allow for continuous communication between the educator and the students, ensuring the educator is able to respond to the students' questions and concerns in a timely manner (Conrad & Pedro 2009).

A constructive element that emerged and contributed to the practical learning experience was the way in which students implemented organisational strategies. They adopted strategies such as creating personal schedules, to-do lists and arranging all their work in a well-organised manner. The students also took it upon themselves to implement constructive routines and to prepare thoroughly for tasks by reading through the tasks and resources ahead of time. The online learning platform forced students to adopt a more active role in their learning and increased their level of responsibility and autonomy, inevitably resulting in their implementing work habits to enhance their learning experience (Hollis & Madill 2006).

Cases one and three identified the significance of the additional learning opportunities and materials in facilitating the learning experiences. These supplementary learning components included tasks and resources the educators offered to students, which focused on areas of further learning and were student specific to bridge the gaps between the students' current level of knowledge and the desired level of knowledge. It is clear that the educators' initiatives to promote further learning of their students according to their needs were valuable to the students. Educators commonly create specific learning opportunities for students to meet their needs – this is an important component to enable optimal learning (Collins 2015; Conn & Hutt 2020).

In case two, however, no reference was made to the benefits of these additional learning materials and opportunities for the students' learning. Various factors could have contributed to this situation, including the fact that the students in case two were more senior and had more in-person clinical experience and theoretical knowledge and might therefore not have required as many supplementary sources to enable their learning. This could reflect the impact of prior knowledge on current learning processes (Clapper 2010).

Multiple critical learning elements supported by the literature were identified across all three cases within the learning constructs of person, environment and learning strategies and activities.

## ■ Recommendations for practice and future research

It is recommended that the findings of the research be used by higher education institutions to promote student learning and ensure an optimal learning experience. This can be done by considering ways through which the identified constructive elements of this study can be applied in future face-to-

**BOX 6.1:** Recommendations for practice.

An exploration of the elements that hindered the online practical learning experiences of participants to determine whether these elements can be addressed or modified to facilitate practical learning in future clinical rotations.

An exploration of the constructive learning elements that can be found when implementing a hybrid approach to clinical education.

face clinical rotations and how a hybrid learning approach can be incorporated to enrich and optimise the students' learning experience.

The online platform is becoming increasingly popular as a means by which education can be facilitated, indicating a shift from traditional face-to-face teaching and learning and more towards the use of a hybrid teaching and learning approach. However, it is inconclusive whether such an approach would be feasible within an African context; therefore, more research concerning the topic is needed. Specific recommendations for future research are outlined in Box 6.1.

## ■ Limitations

The findings pertaining to the fourth-year students might not be an accurate representation of the population because of the smaller number of fourth-year students who consented to participate in the study. Not all clinical educators kept their students' reflections after the clinical block; for some student groups, only a limited number of reflections were accessible, and this had an impact on the completeness of the data. The richness of the data could also have been affected by the fact that the students' reflections and educators' meetings were not initially developed with the intended purpose of being utilised for research that specifically aimed to explore the constructive learning elements that fostered the practical learning of students.

## ■ Conclusion

While an abundance of studies pertaining to ERT and online education is available, there is limited research regarding online clinical rotations in OT in Africa. This study adds to the body of knowledge on the constructive learning elements of online clinical rotations. The constructive learning elements that fostered the practical learning of students included the layout of online activities, the graded process of tasks and the daily schedule of activities with clear deadlines. Further constructive elements were the student-educator relationship, where educators identified and implemented additional learning opportunities in combination with daily feedback, and the repetitive nature of the clinical work tasks and the opportunity for revision, which allowed students

to incorporate what they had learnt, which further facilitated the practical learning of students. In addition, the development of a different perspective through peer evaluation and self-insight through reflective journaling were elements of clinical work activities that also fostered practical learning. These elements emanating from people, environment, activities and strategies all contributed to a constructive learning experience that allowed for autonomous learning by students.

# The learning experiences and perspectives of physiotherapy students during community-based education placements

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## ■ Abstract

**Background:** Community-based education (CBE) can facilitate the integration of theory into practice. It provides the opportunity for students to plan and participate in community-based health care delivery activities. Students' experiences and perceptions influence their learning. Therefore, it is important to investigate the factors that influence students' learning during CBE, which may inform curriculum development.

**Aim:** This study aimed to explore the perspectives of physiotherapy students regarding their learning experiences, challenges and factors that influenced their learning experiences during CBE placements.

**Methods:** A qualitative descriptive case study with an interpretive approach was conducted. All enrolled final-year undergraduate (UG) physiotherapy students at one institution were eligible to participate. Four focus group discussions (FGDs) with 6–10 students per focus group were conducted. Inductive, thematic content analysis was used to develop the main themes.

**Findings:** Twenty-seven (84%) of the eligible students participated in the FGDs. The main themes identified were that CBE provided a distinct and authentic context for learning. The variety of learning opportunities facilitated and challenged the learning process, shaping the personal and professional development of the participants. The design of the CBE offering and the model of supervision influenced their learning. The participants felt that they had made a positive difference in the lives of others.

**Conclusion:** Community-based education provided valuable learning opportunities that led to personal and professional development by fostering interprofessional learning and creating awareness of the influence of social determinants of health (SDH). The nature of the learning activities, the learning environment and the organisation of the placement influenced learning, and each had its unique challenges. Further research is advocated to investigate the students' impact on community-based health care services.

## ■ Introduction

Undergraduate physiotherapy training programmes are essential to produce graduates competent to address client and population health care needs. This competence comprises several interrelated domains of physiotherapy practice, namely, physiotherapy (health care) practice, communication, collaboration, management, leadership and advocacy, scholarship and professionalism (Canadian Physiotherapy Association 2017). To achieve the goal of competent entry-level physiotherapy, UG curricula should offer students a transformative learning experience (Frenk et al. 2010). In the context of health care, this transformative learning experience may involve offering students opportunities

to develop the competency of social responsiveness within service to the community. In recent years, UG clinical education has become central in the social accountability agenda through the development of graduates who are equipped with the value system, technical skills and insight to function purposefully within the changing social and health contexts (Blöse et al. 2019; Frenk et al. 2010). Additionally, for health care professionals to respond to the existing health care demands of the country, innovative methods for the clinical education of health science students are required (Blöse et al. 2019).

Community-based education (CBE) is a key clinical education strategy to offer a transformative learning experience and opportunities to develop and explore skills regarding social responsiveness (Claramita et al. 2019). It entails learning in community settings through active engagement with community members to address real-world problems within that community. In this way, graduates are being prepared as professionals through participating in activities and planning health care delivery within communities. Community-based education, therefore, aligns well with the philosophy of primary health care (PHC), which encompasses a focus on the burden of disease and the SDH. Primary health care in South Africa underpins a system where the health needs of the community are addressed within the community with a relevant focus on person-centred care by promoting equity, prevention, health promotion, curative care, rehabilitation and palliative care (Western Cape Government Health 2014). Primary health care service points are varied and can include home- and community-based care (e.g. schools, workplaces and care for the aged), primary care at health care clinics or centres, and intermediate care (Western Cape Government Health [WCGH] 2014). In the South African context, all physiotherapy graduates are required to participate in compulsory community service that includes placement in rural and underserved communities (Ramklass 2009). Community-based education, therefore, may contribute to producing graduates who are fit-for-purpose regarding the South African health care system (Blöse et al. 2019; Ramklass 2009). This is important, as Mostert-Wentzel, Frantz and Van Rooijen (2013a) emphasised the need to prepare physiotherapy students for the rehabilitation needs of the South African population.

The advantages that CBE has for students, communities and higher education institutions have been documented (Diab & Flack 2013; Strasser 2010; Van Schalkwyk et al. 2018). There are several published studies on physiotherapy CBE investigated at different geographical locations and at different universities in the South African context, which comprise student perspectives (Chetty et al. 2018; Ernstzen, Statham & Hanekom 2014; Misra et al. 2019; Mostert-Wentzel, Frantz & Van Rooijen 2013b; Parris, Van Schalkwyk & Ernstzen 2016), clinician perspectives (Chetty et al. 2018; Ernstzen et al. 2014), educator perspectives (Blöse et al. 2019; Chetty et al. 2018) and client perspectives (Parris et al. 2016). These above-mentioned studies elaborate on

the value and the challenges of CBE for the stakeholders. The learning value and advantages of CBE, such as facilitating a whole-person approach, promoting an understanding about the SDH, integrating theory and practice, promoting situated and authentic learning, developing cultural sensitivity and advocacy role, improving communication skills, and facilitating adaptability and reflective skills, were documented. The aforementioned factors can promote social responsibility and clinical skills, personal and professional growth and preparation for community service (Bloose et al. 2019; Chemane, Chetty & Cobbing 2020; Chetty et al. 2018; Ernstzen et al. 2014; Misra et al. 2019; Parris et al. 2016; Ramklass 2009). Challenges associated with CBE include it being a complex learning environment that requires the integration of multiple and diverse skills, causing some students to feel overwhelmed by the contextual realities of clients, as well as the socio-economic, cultural and language diversity experienced in these settings. Furthermore, limitations in resources were reported to hamper learning and service delivery, such as limitations in human resources, infrastructure and equipment, as well as deficiencies in the CBE curriculum (Chetty et al. 2018; Ernstzen et al. 2014; Misra et al. 2019; Mostert-Wentzel et al. 2013b; Parris et al. 2016). Implementing CBE in the physiotherapy curriculum, therefore, requires a well-planned implementation plan to optimise the learning experience and to balance the advantages and challenges it offers.

The educational experience of CBE is underpinned by various learning theories and pedagogies. We draw on the work of Reid (2011) regarding CBE as a pedagogy of place, which encapsulates situated learning and experiential learning, and a critical pedagogy, and includes transformative learning. The pedagogy of place emphasises that the context of learning powerfully influences the learning outcomes. In CBE, the student is not merely an observer but also immersed in the experience of CBE, thereby activating the transformation process. The learning experience enables students to change the way in which they see and make meaning of the world (Jones 2015).

Students' experiences and perceptions influence their learning, and therefore, it is important to investigate the role CBE plays in students learning and integration of knowledge and skills, including the development of social responsiveness. The research question posed was: what are the factors that influenced the learning experience of final-year physiotherapy students during their CBE placement at Stellenbosch University (SUN), South Africa? The study aimed to explore CBE from the student perspective to determine the value students obtain from the placement, the challenges they experience and the factors that influenced their learning experience. Such information could inform future curriculum development to optimise the CBE offering and learning experience. This study reports on a follow-up study after implementing changes to the CBE offering, following a previous investigation (Ernstzen et al. 2014).

## ■ Methods

### ■ Study design

A qualitative, descriptive single case study was performed using an interpretive paradigm. Qualitative descriptive research seeks to understand a context-specific, real-world setting without manipulating the setting by asking how and why questions, while a case study design enables the researcher to explore and describe the phenomena within a set context that is integral to the phenomena being studied (Yin 2014). The case study was bounded by time and place, activity, definition and context (Baxter & Jack 2008). The case was, therefore, limited to the undergraduate physiotherapy students' final-year clinical learning experiences on CBE in PHC contexts at SUN in the Western Cape of South Africa. Case study boundaries are necessary to delimit the scope of the study (Yin 2014).

### ■ Setting

The setting for the study was the Division of Physiotherapy, Faculty of Medicine and Health Science (FMHS), SUN, South Africa, where physiotherapy is a four-year degree programme. Community-based education forms a core and integrated part of the curriculum and the Clinical Physiotherapy module. At the time of the study, CBE was offered as one of five clinical placements during the year, and learning activities were planned to focus on CBE, working collaboratively with community members, to provide rehabilitation services that benefit the community, and at the same time attaining curricular goals.

The five workplace-based placements for the module consisted of the following: CBE, medical and surgical, neurology, neuromusculoskeletal, a special interest and an elective placement. The placements were based in a variety of settings in the PHC sector. The CBE placement was based in PHC settings and was six weeks in duration, consisting of two to four students per group. There were three geographical sites for the CBE placements, which were based in the Western Cape province of South Africa: one was rural, one urban and one peri-urban. The learning outcomes for CBE were focused on evaluation, education and empowerment of clients, caregivers, community-based health care workers and employers within an interdisciplinary context, as well as conducting a service-learning project. The health care and health promotion activities were performed in group or individual format. Learning activities were conducted in various settings, for example, community clinics, health care centres, client homes, places of work, schools and other primary health settings. The activities of each CBE differed based on the context of the placement. Clinical educators visited the students once or twice per week at the placement to provide support and were also available for remote consultations via telephone or email.

## ■ Population and sample

All enrolled final-year undergraduate physiotherapy students at SUN, who had completed their CBE placement, were eligible to participate. Purposive sampling (Etikan, Musa & Alkassim 2016) was used with the criteria of being a final-year student at the institution and having completed the CBE placement. At the time of the study, the total number of students eligible was 32 out of the total 40 students. Because of the timeframe of the study, eight students were not eligible to participate as they had not yet completed their CBE placement.

## ■ Instrumentation and procedure

The SUN Health Research Ethics Committee provided approval to conduct the study, project number N12/10/061. The research team developed an interview schedule based on the study objectives and informed by similar, available literature on the topic (Ernstzen et al. 2014; Mostert-Wentzel et al. 2013b; Ramklass 2009). The topics covered in the focus group discussions (FGDs) were as follows: summary of your CBE experience, valuable aspects, stumbling blocks encountered, helpful strategies implemented, interprofessional learning (IPL), level of preparedness and suggestions for change. The interview schedule is included as Appendix 1.

Dawn V. Ernstzen (principal investigator) contacted the eligible students via email, informing them about the purpose and procedures of the study, invited them to participate and arranged an appropriate time and venue for the FGDs. Written informed consent was requested prior to each interview. Four semi-structured FGDs consisting of 6–10 students each were conducted. Focus group discussions were conducted in an isolated lecture room at the FMHS campus. Ilse S. Meyer and Anna M.S. Schmutz conducted the FGDs (one interviewer per group) and interacted with the participants posing questions, clarifying their statements and the meanings they ascribed to their experiences. The FGDs were conducted in two South African languages, Afrikaans and English, ensuring that each participant had the opportunity to communicate in their language of choice. The research team consisted of the clinical coordinators at the time of the study. The coordinators were not directly involved with specific teaching, learning and assessment activities on the CBE placements. As clinical coordinators, the authors were interested in optimising the clinical education offering for the stakeholders involved.

## ■ Data management and analysis

The interviews were recorded on a digital voice recorder and downloaded, and a unique serial number was allocated to each voice recording. The recordings were transcribed by an independent transcriber. Inductive thematic content analysis was used to identify features, characteristics and patterns in the data.

The steps of analysis advocated by Braun and Clarke (2006) guided the content analysis, namely, becoming familiar with the data, interpreting the data by coding, and categorising and contextualising the texts. Ernstzen and Schmutz independently assigned initial codes and categories. These underwent peer checking when discussed in the research group for verification to enable iterative data analysis. Ernstzen then coded the data via Atlas.ti (Scientific Software Development, GmbH, Berlin, Germany, version 9). The research group worked collaboratively to formulate the overarching themes, relationships and patterns between the themes and categories to ensure peer debriefing and reflexivity in approach. The transcripts were available in English and Afrikaans, based on the language that the participant used in the FGDs. The data were analysed in their original language to capture the meaning of each quote. The Afrikaans quotes were independently translated by Ernstzen for the purpose of this report. All translations were checked and verified by Schmutz and Meyer to ensure accuracy. Member checking with the participants could not be conducted because the study was conducted towards the end of the final year, and the results were synthesised only after the participants had graduated. The themes and their categories were externally audited by a peer reviewer.

## ■ Trustworthiness

The quality criteria of credibility, transferability, dependability and conformability were considered (Frambach, Van der Vleuten & Durning 2013). The use of multiple data sources (four different FGDs) with diversity in CBE exposures (clinical site location and settings) enabled source triangulation. We were unable to do member checking because of the timing of the research (at the end of the final year). Data saturation of the main study concepts was achieved. Data were analysed through independent analysis by members of the research team, enabling investigator triangulation, followed by a convergence process to reach a common understanding of the case (Baxter & Jack 2008), which facilitated iterative data analysis. Through the above process as well as the documentation of the research, peer reflection occurred. An outline of the context of the CBE placement was provided, and quotes were provided in full sentences to enable a thick description. The translated quotes as well as the synthesised data were peer-reviewed. The criteria for purposive sampling were clear. The data were collected over a period of three weeks, which enabled iterative data collection and in-process analysis. In the discussion section, we report and reflect on alignment with similar studies to put the results in context.

## ■ Findings

The response rate was 84% (27 of the eligible 32 participated). Those who declined to participate listed prior engagements as a reason for non-participation.

The major themes and sub-themes that emanated from the study are summarised in Table 7.1. The three major themes comprised the impact of contextual or situated learning, the role curriculum features play in the learning experience and participants’ reflections on their personal and professional development. Each theme is presented with its learning value and the challenges that were associated with it. Substantiating verbatim quotes are provided with reference to the FGD number, whether the placement was considered rural (R), urban (U) or peri-urban (PU), the section of the transcript and whether the quote was translated (e.g. FGD1, U:45T).

## ■ Theme 1: The impact of situated learning

The CBE placement provided a rich and authentic context for learning and included facilitatory and challenging learning tasks. This stimulated participants to work on creative and person-centred solutions for their clients’ challenges. Participants declared to have made changes in the way they thought about and approached real-life challenges that they faced in this setting. Most participants appreciated the variety of learning contexts and learning opportunities that were provided for them, although some found the variety

**TABLE 7.1:** Major themes, sub-themes and categories regarding physiotherapy CBE.

Theme	Sub-theme	Category	
<b>1. The impact of situated learning</b>	Context for learning	Distinctive learning environment	
		Application and Integration of learning	
		Holistic view	
		Person centeredness	
		Creativity	
	Distinct learning opportunities	Environmental awareness	
		Diverse language use	
		Autonomous learning	
		Collaborative learning	
		Interprofessional learning and teamwork	
<b>2. The role of curriculum features</b>	CBE structure/organisation	Diverse language use	
		Structure	
		Variety	
	Preparation	Time management	
		Preparation for the placement	
		Preparation for future practice and community service	
	Clinical supervision for CBE	Approachability	
		Timing and orientation	
	<b>3. Personal and professional development</b>	Catalyst for development	Personal development
			Emotional adjustment
Making a difference		Impact	
		Empowerment	

Key: CBE, community-based education.



overwhelming at first. They could interact with different clients across ages and with fellow students who were also placed in the CBE setting. Working and learning with peers from different professions towards a common goal for each client assisted the participants with role delineation and provided them with the opportunity for integrated learning and teamwork.

## □ Sub-theme 1: Context for learning

The different settings of PHC, the different communities in which the students worked and the variety of clients with different health and social needs created a context for learning which was distinct (different from other placements). This unique learning environment supported the application and integration of knowledge and skills, a holistic and person-centred view of the client and their rehabilitation needs, which facilitated creative thinking skills. Participants became aware of environmental factors applicable when working outside of hospitals and clinics.

The CBE learning environment was identified as *different* and *distinct* when compared with providing care in a hospital or clinic. In CBE, the clinical environment was the client's home or workplace, and participants reported a change in mindset about being a professional in atypical clinical workspaces. Treating the client in their natural environment allowed for a clearer understanding of optimised goalsetting, as illustrated by the following quotes:

'You know how to engage in a treat or an evaluation of a patient in a hospital or a clinic, but to go to someone's house is a totally different setup because the whole family is there.' (FGD4,R:7)

'Sometimes you don't understand why patients do not show progress. Until you get to their homes. Then you make one change or adaptation. Then the patient is very happy. I think that is a much more effective treatment at the patient's own home.' (FGD1, U:29T)

'You park in the streets and now you have to walk into this person's home and actually firstly have an effective evaluation and just know how to be, how to interact with then, how to be professional and be still respectful in somebody's home.' (FGD3, R:27)

The participants reported that the CBE placement facilitated the *application and integration of knowledge*. Participants became aware of the value of preparing a client for discharge and the relevance of the questions that they learnt to ask about the home environment and the social circumstances of the client. Such information impacted their therapeutic planning:

'To be able to ask the relevant questions when it comes to social things in the hospitals, because I didn't know how important it was to ask how the home environment is. Like, I overlooked some things like stairs and all of that. And like space, like if with discharge, if the patients are going be able to have space for their walking frames.' (FGD1, U:3)



'When I started the community block, I realised the value of what we teach them in the clinic or the rehabilitation centre before they go home. And you can understand what you are working towards and in what circumstances people live.' (FGD2, PU:13T)

Community-based education enabled the development of a *holistic view* of their clients' well-being, which was facilitated by exposure to various environments in which the clients lived and worked. These included the role and influence of the family and the psychosocial aspects of coping with a health condition. The different layers of exposure and the meshing together for the different components of care enabled the participants to draw together their learnt information to a whole-person approach:

'I got a much more holistic view of everything which was often in hospitals very direct, whereas in the community for me I just found it is so much more about the family and about their feelings and their beliefs and how they deal with every day.' (FGD4, R:1)

'This block was just a meshing of everything together. We got everything in one sometimes and you get to focus and broaden your mind to the whole picture of the person and not just a certain aspect of him being the neuro problem.' (FGD4, R:3)

'I think you have better insight of what is going on. If it was my first block, I would have approached all my other placements differently. This block has now brought everything together.' (FGD3, R:36T)

The above holistic view also translated into a *person-centred approach* as participants recognised how individual clients' circumstances and needs differ. The exposure to the different clients' contexts helped them to develop and understand an individual beyond their health condition, enabling a humanistic view:

'It was really nice and I like how it shifted my mind off the medical centred approach into a community-based one. So, we actually understood patients as individuals, as persons and not like looking at their conditions or the diseases that they have. It was nice to go into their households.' (FGD1, U:1)

'You don't understand what people are struggling with at home. You think it is simple, because there will be someone to help the patient, but often there is no-one. And you get there and they can do nothing for themselves, but they can actually be more functional.' (FGD2, PU:14T)

The context of the CBE, underpinned by the different environmental and social challenges that clients faced, helped the participants to *think creatively* about solutions to assist and empower their clients in imaginative ways:

'So, definitely it makes you very creative, because you don't know what you are going to see or what your problem is going to be. Because your patient in the hospital will have different problems like, okay, they want to walk in the hospital, but at home they want to be able to stand and make a cup of tea or make a sandwich or something like that.' (FGD1, U:5)

'You don't get the opportunity on any other block to do health promotion. You have a lot of people, and you have to present something to them. If you are shy,

you quickly need to learn how to present in front of an audience. But I do think that you lean to make it interesting, else the people are not going to listen to you. So, it makes you think more creatively.' (FGD2, PU:18T)

As much as the participants reported enhanced learning via CBE environment, they developed *environmental awareness* regarding safety in community settings. They acknowledged that they felt like visitors in the community and were cautious when entering the community for the first time. They became aware of strategies to implement to ensure the safety of themselves and others. The community care workers were nominated to be an essential resource in navigating students through the community:

'And at all times, they said [...] told us to have someone at the clinic's number, to have our supervisor's number, to have the police station's number.' (FGD4, R:13)

'Our community care workers ask every time can we come for a visit if everyone is at home. Like in a respectful way, you don't just barge into somebody's home and take over.' (FGD3, R:42T)

'I was a bit afraid, but after the first time I was fine. So, if they told me beforehand, that if you go with the community care worker, they welcome you in. You don't need to worry.' (FGD1, U:18T)

'So, a person never went into an area if it was unsafe at that point. I never felt unsafe in the area that we went to.' (FGD2, PU:23T)

Community-based education provided a variety of learning opportunities, which were often facilitated by participants' encounters with various challenges for reaching rehabilitation goals. Participants seemed to have become acutely aware of the connection between care and relatedness in their clinical practice.

## □ Sub-theme 2: Distinct learning opportunities

Students were afforded the opportunity to participate in different learning activities, some of which had unique elements. The various learning opportunities comprised therapy at home, exercise classes, educational group classes and interprofessional group discussions. These learning opportunities fostered autonomous learning, collaborative learning, IPL and using different languages.

One of the central tenets of the CBE was that participants reported *autonomous learning* as they became responsible and accountable for their own learning and providing quality care for their clients. They were expected to work independently, which had positive effects on their self-directed learning trajectory:

'We like to keep ourselves accountable for what to learn. Nobody is going to tell you okay, you need to know this, you need, you need to know that.' (FGD1, U:37)

'It was very realistic. Like you felt very responsible, because that woman has a stroke and they can't get over there or they have an amputation. So, you felt really, responsible and there wasn't anybody looking behind your shoulder if you are

doing the work. So, it was you and doing the work properly so that the patient could be effective.’ (FGD3, R:4)

Autonomous learning, according to the participants, did not involve learning on your own but rather *learning collaboratively* with peers. They learnt not only *from* peers but also *with* their peers. They reported learning about each other’s roles in client care, and they learnt different ways of thinking and doing. They came to appreciate how much they could learn from their peers:

‘It really is a holistic approach every time. Like with a home visit with the other members of the interdisciplinary team. It was nice because you didn’t know what the others do. So you get there and you see what they do. It is no longer theoretical, but you experience how they put it into practice. And together you do more in one session.’ (FGD3, R:5T)

‘But I realised what someone could change to my practice, we complemented each other, and it was really amazing to see how someone else thinks. I could implement it in my next blocks, I would not have done it that way if I had not worked with that person.’ (FGD3, R:12T)

‘I did not realise it till that block (CBE); just how much I learn from other students. Just their approach because they had other experiences and with other educators.’ (FGD3, R:13T)

Learning and working with peers and with different members of the health care team facilitated IPL. Interprofessional learning was facilitated by the proximity of peers who were on the same placement, involved in the care of a client and during interdisciplinary group discussions. These IPL opportunities facilitated referral, goalsetting and practical care of clients:

‘That was the best for me. If you refer, you go that person and you talk to that person. You give a refer letter as well, but then you also discuss with them when are they going to go visit and you ask how about it. For me this was cool. So, then you get this further follow-up on the patient.’ (FGD4, R:5)

‘The interdisciplinary sessions were nice. We had a meeting once per week where we discussed and developed common goals for our patients. We worked together, goal oriented, for the patient.’ (FGD2, PU:7T)

‘Home-based care education is important as well because they play a big role. I saw how one of the home-based carers transferred a patient from wheelchair to bed and back beautifully. He was taught by [...] and [...]. It was amazing.’ (FGD1, U:33)

Participants reported on the opportunity to learn and implement *different languages*. Language was also noted to be a portal to foster a sense of belonging for the students in the community in which they worked:

‘And the Xhosa, it was nice, because you learn a new word and you say it in a different way. And they laugh at you, but you build a bond with that person. And you say the word and they laugh, and you feel you become part of them.’ (FGD3, R:14T)

‘We had to give a lot of classes and in class you can choose if you want to present in Afrikaans or in English. So, the culture is very Afrikaans. So, I had to present my classes in Afrikaans. For me it was very, very challenging, because sometimes I’ve

looked at [...] for words. So, that was quite a stumbling block hmmm, but I learned quite a lot and I grew quite a lot. But then it became better and better.’ (FGD3, R:16)

The CBE learning opportunities challenged students to adapt their approach to working with clients and the members of the health care team. They became aware of how much they could learn from diverse stakeholders. They also experienced how language can facilitate their interaction with community members, although they acknowledged their limitations regarding diverse language use.

## ■ Theme 2: The role of curriculum features

Participants had a variety of perspectives regarding the curriculum’s ability to prepare them for CBE. They provided suggestions on how the curriculum should be adjusted to better prepare them for CBE. The diversity of learning opportunities and locations for service points that the CBE placement provided were viewed as a challenge. Moreover, it was challenging for participants to organise their own work programmes, which they contrasted with other placements where their work programme was predetermined by the routine of the hospital, clinic or school. These challenges were thought to improve the development of participants’ time management and organisational skills. Participants had diverse experiences regarding the role of the clinical educator in this placement. They appreciated the supervision they received, particularly the approachability of the educator. Some requested more supervisory time and more extensive environmental orientation at the start of the placement. There was agreement among participants that the CBE placement prepared them for what they could expect from compulsory community service.

### □ Sub-theme 1: Community-based education curriculum structure and organisation

Various factors of the CBE curriculum were reported to impact learning, namely, the structure of the placement, preparedness for the placement and the clinical supervision offered.

The busy and diverse nature of the CBE offering reportedly challenged the participants. They reported finding the diverse clinical activities uncomfortable and unsettling at first, until they developed skills to deal with this challenge. They mitigated diverse *structure* by changing their mindsets to become more flexible, organising themselves, planning and associating the structure to what they might encounter during compulsory community service. Not all participants reported being able to cope with the structural demands of their CBE placement:

‘And here you don’t even know where you need to drive to the following day. You just drive. I think it was good because it is just like it will be next year. You will need

to sort out your own things. So I think it is actually a good learning experience, even though it is not so comfortable.' (FGD3, R:15T)

'I found it difficult in the beginning because you had to focus on different sites. There were five sites to focus on, every day a different place. And it is difficult getting comfortable in the different spaces with different people. And then there were home visits also. It was difficult to find a structure and work with it. In the hospital, the structure is already there. You just go with the flow and work. Here you have to form your own structure that will work for you.' (FGD3, R:8T)

Some participants found the extensive *variety* of learning tasks and experiences on CBE overwhelming, and others found it enlightening. The variety enabled the participants to develop diverse skills, and they learnt how to adapt their rehabilitation approach:

'It was really very nice and like and it showed physio on a different level, like going into schools, going into the different clinics and the gym clubs and the different exercise classes - how to adapt exercises for different [...] for patients in different levels of function. It was such a new, good experience for me.' (FGD1, U:3)

'It was a very busy block, but we learnt so much. It was a good experience.' (FGD2, PU:4T)

'And what made it good, was the (therapeutic) classes, three or four different types of classes. The one was a back class, the other was for stroke, and another for arthritis. So, it is different kinds of exercises, different types of classes that you need to develop.' (FGD2, PU:8T)

The diverse and flexible nature of the CBE placements challenged participants' *time management* skills, while some appreciated the opportunity to develop their organisational skills:

'A stumbling block is time management. If you don't have organisation and time management, you can't completely fulfil what they expect of you and that [...] I always just think that I was a chaotic time manager, but at least the organisational side.' (FGD3, R:20)

'So, a lot of organisation and thinking ahead were just actually good skills for us to develop, like if we haven't already, for next year. So, although it can be a stumbling block, it's an advantage as well for a skill we have to develop for our future.' (FGD3, R:21)

The CBE structure and organisation, comprising various activities and timeframes each day different from the structured hospital and clinic-based clinical environments participants were used to, posed different challenges to participants. These challenges posed an uncomfortable disorientating dilemma for some, while others flourished.

## □ Sub-theme 2: Preparedness

Participants named two notions for preparedness, namely, being prepared for the opportunities that CBE offers and CBE as a vehicle to prepare themselves for becoming rehabilitation professionals.

Regarding *curriculum preparation for CBE*, some participants felt prepared regarding cognitive and clinical skills. Others felt ill-prepared regarding organisational skills. Participants reported uncertainty regarding the learning goals for CBE and what to expect:

‘I think in that sense what’s equipped us is how we’ve been taught here at [...] like in our four years [...] how we have been taught prepped us for that block, because the lecturers have taught us to think critically, think for yourself, think specifically for that patient and not necessarily for like a certain movement that you want, but for the patient as a whole personally.’ (FGD1, U:21)

‘What is community block, you know, and what are the skills and the referral systems and what is the aim of it? So, you kind of just got there and you kind of had to kind of adapt and see and referral and what’s the aim kind of thing. So, I didn’t feel like university prepared us, but once you got there and you got your supervision or you talked about it with [...] and you spent the weeks, then you got a bit more.’ (FGD3, R:26)

‘I think we should have an orientation session beforehand, also to clarify what is expected from us? Expectations, not just for the assessment, but what will you need to do, you need to do a home visit, classes and so on. What do you want us to learn from this block?’ (FGD3, R:28T)

Participants believed that CBE *prepared them for future practice as qualified professionals and community service*. Some also viewed CBE as a transition from co-dependent to independent practice, appreciating the supportive role of the university as they developed:

‘So, if you’re not exposed to it in the university where, where they’re guiding you and they’re teaching you and you’re going to end up with this major shock one day once you’re professional which is not exactly what you want. You want qualified and skilled people in those positions. So, you need exposure in the university. So, it’s [CBE] a worthwhile experience.’ (FGD3, R:39)

‘I loved it. Like I feel so much more excited about actually working in community next year and getting fully involved in community – not really in a hospital, but where people actually need you [...]’ (FGD4, R:21)

‘On the Community block, you have to think for yourself, and I think that is that is what we all need for next year. Now you still have the assistance from the university side, but you need to make a plan by yourself. You don’t have equipment with you. You have to work around that. You still have to help the patient. You develop a lot as a person.’ (FGD1, U:20T)

Aspects for improvement in being prepared for CBE would enable participants to adapt easier to the distinct learning environment. They valued the CBE placement as a transitional and supportive process for compulsory community service.

### □ **Sub-theme 3: Clinical supervision for community-based education**

The participants emphasised the value of the clinical educator in supporting their learning. Learning was optimised if the educator was approachable and provided a thorough orientation to CBE.

Participants viewed the clinical educator as *approachable* when the educator was accessible and cordial. The supervisor was named as imperative in the participants' process of development:

'And we bring cross questions, but if we had like a random question in the middle of the day, you could phone her or sms her or something and she'd like give you feedback on the spot. Emails [...] That was really nice. She was approachable.' (FGD1, U:36)

'And [...] is such a great supervisor and the way she explained things just makes you [...] or asked you questions makes you think out of the box. She just helped us grow dramatically. So, it definitely helped.' (FGD4, R:18)

While some participants believed that sufficient time was spent on clinical supervision, other participants reported insufficient time allocated to certain educational activities:

'I don't think any of us ever felt that we are getting any less than what we're supposed to have, but the time you had was really contentfully planned, knowledge wise.' (FGD4, R:26)

'When we were there, we lost the first week, because it was just basically admin discussion and that other week we lost. And then the last two weeks was exam, that's not supervision either. So we only had two hours of supervision on the whole block and that's not enough.' (FGD2, PU:21)

The participants' discussion elaborated on the aspects of curriculum features that influenced them to become accustomed to learning and working within the community. They emphasised the role of a thorough orientation to CBE goals and activities and support to cope with CBE challenges, as well as the attributes of the CBE educator. Nonetheless, they valued CBE as a transition to independent practice.

### ■ **Theme 3: Personal and professional development**

The CBE experience shaped participants' personal and professional development and provided them with a sense of making a positive difference in the lives of others. Community-based education provided an authentic yet emotionally challenging learning environment. Such challenges encouraged participants to reflect deeply and to initiate thoughts about their own social responsiveness in their personal and professional lives. Participants described their awareness of the value they added to the quality of life of the clients, which was evident in the appreciation received from their clients. The impact of client education and empowerment for PHC became a reality for the participants.

#### □ **Sub-theme 1: Community-based education as a catalyst for growth**

Community-based education was a mechanism for personal and professional development through participants becoming aware of their personal contributions making a difference in the lives of others.



Participants listed awareness of their own *personal development* and potential as a key CBE outcome. They reported becoming more self-aware, confident and developing humility:

‘And it’s so much more than physio [...] There is so much more like in your personality that comes out which you have to invest in what you are doing. So, it’s kind of getting to know yourself a lot more too, so much more than just the physio.’ (FGD4, R:33)

‘You gradually build up. Your exposure grows so that you get the confidence to be like okay, I am going to attempt it on my own. I can manage it.’ (FGD3, R:33)

‘What stood out for me was the fact that we sort of had the tools to empower these patients instead of actually just doing our treatment and leave them. We changed something to [...] you know, to make their life easier. And then the other thing was that it made me humble.’ (FGD1, U:4)

‘You helped them for the better and it’s not about you. It’s got nothing to do with you. And I hope that you learn from helping them, but in the end it’s all about patients.’ (FGD1, U:26)

Various aspects of the CBE experience required an *emotional adjustment*. Participants mentioned the different demands of the placement and the realisation of the social and health care needs of some clients. They valued peer support during these challenging situations:

‘To be honest, it was overwhelming for me. It was my second last block. Most of my other blocks were in hospital or in the clinic. But this block was a total mind shift, and XXX said from the beginning, we need to think outside our boxes. You need to think creatively.’ (FGD3, R:6T)

‘It’s just that for you it’s emotionally draining because we spoke about it for days afterwards, like who [...]? There’s nothing we can do for that person.’ (FGD1, U:12)

‘For me it was also very upsetting to see peoples’ circumstances. But I think we supported each other with that. It was nice that we were three in our group, it was good because we could support each other.’ (1:13T)

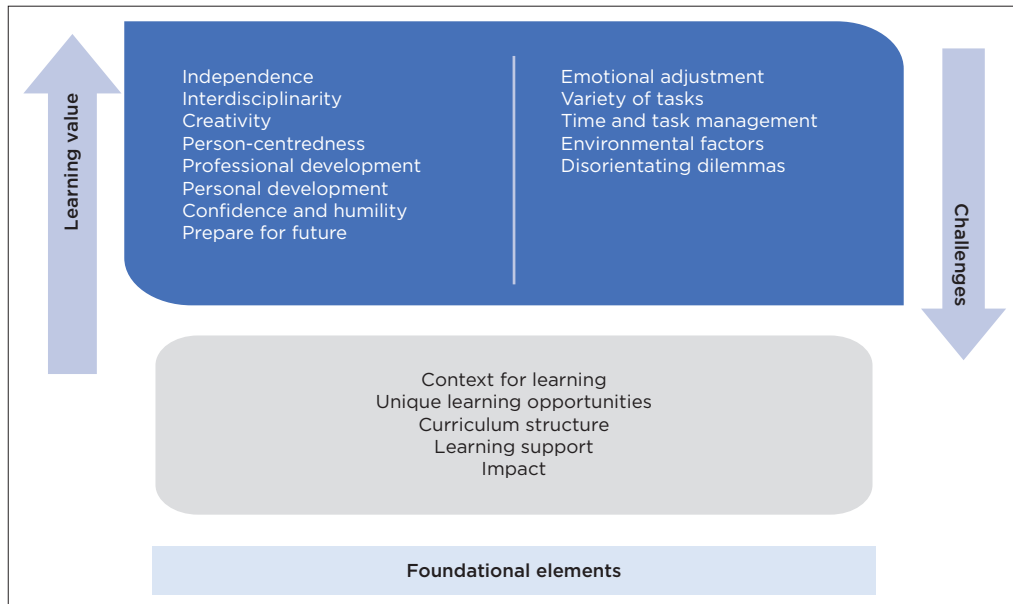
## □ Sub-theme 2: Making a difference

Community-based education made participants aware of how they can contribute to social accountability by *making a difference* in the lives of others. Some participants recognised the value of education to empower clients and realised that care encompasses the family and the community in which a client lives to make an *impact*. This awareness was fuelled by the appreciation from the clients for the services rendered by the students:

‘I think community was the one that I felt that I made the most difference, because it was [...] Ja, you are really in their house, and you are trying to change their life in their house in the community. So, for me out of all my blocks I felt that was the one I made the most impact so, like in the people’s lives.’ (FGD1, U:10)

‘You can only do so much for the people you have to [...] Ja, just kind of education for them to prevent themselves. And because we rotate. We’re not there the





Source: Authors' own work.

**FIGURE 7.1:** The foundational elements of community-based education, with learning value and challenges.

whole time. Most of them don't even have access to the clinic and always is more to kind of invest your knowledge into them so that they have a picture or a basis of what you do in case this does happen or this does get worse or [...] But limited resources I say it was.' (FGD4, R:30)

'I think they appreciate any help they can get. They're so grateful for people coming and so many of them aren't able to make it to a clinic – so they are so grateful. So, he was so grateful to have someone else come and show him how to walk. It changed his life completely. And if you have a goal like a functional goal, something they can reach in that session; then it just changes. They don't think it's a waste of time.' (FGD4, R:9)

Participants reported a positive reciprocal relationship of development between themselves, the client and the community they served. Their comments echoed the value they attach to making an impact in the lives of others, which in turn impacted how they viewed and valued themselves as future professionals. The foundational elements of CBE were valuable for learning, despite challenges (Figure 7.1).

## ■ Discussion

This study adds to the body of knowledge on the learning value of CBE placements for physiotherapy students. Participants in this study acknowledged CBE to be a challenging yet rewarding learning experience. Community-based education provided an immersive and transformative learning experience, which shaped the participants' professional identities. The variety of learning

opportunities in different settings of the community facilitated the awareness of the SDH, social accountability and the role of the family in a health care system. The challenges and constraints reported indicated that a firm support system, a well-planned orientation and graded, longitudinal exposure to learning within community settings are important to obtain the most value from the CBE learning experience and for students to cope with the unique demands of a CBE placement.

The findings of the study indicate that CBE, when implemented as a core part of the curriculum, may play an important part in attaining curricular goals and integrating and consolidating the various essential competencies of becoming and being a physiotherapist. The learning opportunities offered were distinct from other placements and enabled participants to develop academic, personal and professional skills, thereby facilitating the key competencies of a physiotherapist (Blöse et al. 2019; Canadian Physiotherapy Association 2017). Their embodied learning experiences facilitated the implementation of theory into practice and reflective skills. In particular, the participants reflected on how to behave as a professional in someone else's home, where the home becomes the clinical environment. One of the unique benefits of the CBE was the facilitation of the whole-person approach, accompanied by the implementation of person-centred care, which was underpinned by exposure to home, school and work environments. The above aspect was helpful in illuminating the importance of considering the context relevant to the client from the onset of the rehabilitation process. Another strength of this contextual learning opportunity was enabling participants to develop an understanding of the continuum of care from an acute hospital setting to a community setting. Congruent with the findings of Blöse et al. (2019), participants felt despondent by the lack of resources, yet realised the importance of thinking creatively within a resource-constrained health care system. Although CBE was a disorientating, challenging learning experience, participants gained by developing insight into various communities, the impact of the SDH, community resources, infrastructure, family responsibilities and community support systems. The above factors were named as factors that play a role in learner transformation when they become aware of their positions of privilege, as well as aspects of equity and social justice (Reid 2011). The transformative learning experience is important to provide students with the opportunity to become health advocates for their clients (Chemane et al. 2020; Frenk et al. 2010).

The study did not focus on social accountability; however, participants reported their awareness of the impact they had in optimising functional ability in the lives of others by small yet worthwhile initiatives that were implemented. These initiatives included adjusting the home, school or work environments and providing advice on alternative ways of performing daily tasks, thereby creating an enabling environment to optimise function and

improve the quality of life for these clients. Participants reportedly gained insights regarding the approach to care and applicability, relevance and feasibility of education and advice when provided in a non-community setting (e.g. hospital or clinic), which is deemed important for future practice (Mostert-Wentzel et al. 2013a). This led to them adapting their client's educational offerings to make them more relevant and applicable to the client's circumstances. The above contributions of making a difference in the daily life and productivity of clients could potentially be the building blocks of compassionate care, social responsiveness and transformative learning. This finding contrasted with the findings of Parris et al. (2016), whose cohort reported challenges with the development of client-centred care and a lack of information on social responsibility. Therefore, an in-depth analysis is required on implementing strategies to foster social responsibility in the context of CBE and the physiotherapy curriculum.

There are several implications for curriculum planning that can be derived from the findings of the study. The participants felt partially prepared for the expectations and challenges they faced on the CBE placement. While they felt prepared to manage the different health care conditions with their knowledge and skills, they felt ill-prepared regarding exposure to community circumstances and organisational aspects. Participants reflected on their emotional experiences upon realising the contextual realities with which clients are faced, which correspond to the findings of similar studies (Blöse et al. 2019; Parris et al. 2016). The above analysis indicates that adequate support and preparation are essential when initiating CBE to prepare students for potentially emotionally challenging circumstances. Graded exposure to the concepts of CBE, the contextual realities in community settings, social-cultural factors and the SDH could potentially assist with coping with the challenges of the placement. Indeed, Reid (2011) advocated community-oriented education in the curriculum, where students learn about the community from within a classroom, culminating in CBE activities, where teaching and learning take place in a community setting. Community-based education developed skills for environmental awareness, which included attention to safety aspects. This notion of safety considerations regarding health care workers working in various settings, including the community, was also reported by Ramklass (2009) and Williams et al. (2014). It is, therefore, advocated that clear criteria and procedures for the safety of health care workers should form a core part of the CBE curriculum. In the COVID-19 context, the safety aspects would also include access to personal protective equipment and guidelines for screening and prevention during community-based activities. Adequate preparation is key for the effective implementation of CBE (Blöse et al. 2019; Chetty et al. 2018; Ernstzen et al. 2014; Parris et al. 2016). However, full preparation may not be attainable, and it is the immersion in a different context that creates a challenging experience to profoundly impact the student's development.

There was a strong emphasis on the value of IPL and collaborative learning as part of CBE. Interprofessional learning was facilitated by accessibility to team members, dedicated activities, and shared student accommodation (university residences). In such circumstances, the role of the co-curriculum enhanced learning, as participants were able to reflect with peers on their learning experiences. This reflection, in part, assisted them in deriving meaning from their shared learning experiences, which is deemed important to understand the self and to inform future action (Sandars 2009). A particular strength of IPL was that students experienced the various roles of team members and how the different roles could be capitalised on to optimise clients' outcomes. These findings are encouraging, as previous studies cited a lack of IPL in CBE (Ernstzen et al. 2014; Misra et al. 2019), resulting in limited role awareness (Mostert-Wentzel et al. 2013a). Participants emphasised the valuable role of community care workers as members of the health care team in their learning journey. Community care workers fulfilled multiple roles that included a two-way educational process between the workers and the students, as they assisted with communication, acting as chaperones, and assisted with client care. Community care workers can play a role in bridging the reported language barriers and difficulties with cultural adaptations that have been reported previously (Chetty et al. 2018; Misra et al. 2019; Parris et al. 2016). The importance of collaboratively working with community health care workers and volunteers who are part of the community was underscored. Community-based education played an important role in the development of IPL between peers, colleagues and educators. Moreover, it contributed to professional socialisation and professional identity formation (Reid 2011).

This study confirms that clinical educators play an important role in shaping the learning experience for the student in CBE (Blöse et al. 2019; Claramita et al. 2019; Misra et al. 2019). Varied experiences and expectations regarding clinical educators were reported. Some participants valued that they were not constantly supervised to provide them the time to explore their own skills and creativity, while others requested more supervision. Previous studies cited a lack of supervision as a barrier to learning in CBE (Misra et al. 2019). Given the distinct learning experience that CBE offers, which is different from those placements based in hospitals, health care centres and rehabilitation centres, it seems necessary that the CBE clinical educator needs to take advantage of the unique learning opportunity that CBE offers. The distinct nature of community-based placement therefore indicates that the CBE clinical educator should have a distinct approach to clinical education. In this study, the orientation to the site, the practical advice and the approach to holistic care that some educators provided were appreciated. The role of the clinical educator in this context may focus on facilitating critical reflection, aiming for the development of a sound understanding of the health care system, understanding the principles of PHC, understanding the SDH and inspiring

students to be socially responsive. In the current investigation, not all CBE placements offered the same learning opportunities; however, the unique structure and different challenges experienced contributed to the development of different skills when compared to other placements. Clinical supervision and the learning opportunities offered therefore need to be tailored to the context of the CBE placement to make the most of the situated learning experience (Reid 2011).

## ■ Implications

This study served as a follow-up study after a similar investigation (Ernstzen et al. 2014), which informed adaptations to the CBE curriculum. This study indicated some success in optimising CBE at the institution. Interprofessional and collaborative learning opportunities have been successfully incorporated and are valued by the students. Community-based education remained a disorientating experience, which created a catalyst for learning various skills and values. Most notably, the emphasis of CBE has moved to community-based activities, where previously it has been on individual treatments (Ernstzen et al. 2014). This may also have led to the participants' awareness of enacting social responsibility and their feeling that they are making a difference in the lives of their clients, a curriculum aspect recommended by Parris et al. (2016). On the contrary, activities that still require development are the clarification of expectations for CBE and clarification of the role of the clinical educator in CBE. Community-based education remains a significant vehicle to prepare graduates for compulsory community service. The above notion was confirmed by Mostert-Wentzel et al. (2013a), who identified common challenges for physiotherapy community service. These challenges included the need to manage diverse health conditions, cultural diversity and limited access to resources. As in this study, Mostert-Wentzel et al. (2013a) emphasised the need for health education and client empowerment as key health care strategies, the importance of interdisciplinary teamwork and the need for knowledge about the SDH in CBE. The findings of the study underscore the need to regularly review the curriculum module to ensure that learning experiences and contexts address learning outcomes sufficiently.

This study provides baseline information about physiotherapy students' views regarding social accountability to add value to the lives of community members. The participants' reference to community safety awareness and their suggestions for an integrated approach to CBE may be useful for curriculum planning. The results indicated that CBE can be a vehicle for the integration of a humanistic and decolonising pedagogy when CBE is planned with the community for the community (Pentecost et al. 2018).

Additionally, the need for a firm and diverse support system for students was identified as an important consideration. The participants mostly reflected on individual clients, families, small organisations and selected groups, such as schools. Strasser (2010) advocated for a more comprehensive community engagement approach to optimise the relationship between stakeholders.

This study confirms the mutually beneficial relationship of CBE for the students and the community members, and to a lesser degree strengthening the health care system, by providing easier access to health care. The findings may contribute to the development of a CBE model that is tailored to the South African context (Chemane et al. 2020), addressing the unique demands or needs and health priorities of South African communities. Future similar research can explore the nature of the development of the different competencies such as scholarship, advocacy and cultural competence in the context of CBE, as well as the enhancement of social responsibility in more depth. Additional research is required on the short-term and long-term impact the CBE has on students and communities participating in CBE.

## ■ Limitations

We acknowledge that data collection for this study was conducted prior to the COVID-19 pandemic. Consequently, the clinical placement structure at the Division of Physiotherapy evolved to cope with the changing health care priorities and demands. Nonetheless, the findings of the study offer valuable insights regarding factors to consider in developing fit-for-purpose (clinical) curricula in South Africa. Community outreach and community-oriented learning activities have been severely hampered during the pandemic, and therefore, health and safety during resuming similar activities are important to limit the spread of COVID-19 while widening access to rehabilitation services in South Africa.

This case study results may be transferable to comparable settings; however, the results are based on the perspectives of a specific cohort of students at one university and cannot be generalised. Although the authors were not directly involved with the provision and assessment of CBE, they were the clinical coordinators, which may have influenced participant responses.

## ■ Recommendations

Box 7.1 outlines the recommendations for practice that emanates from the study.

**BOX 7.1:** Recommendations for practice.

Community-based education should be a core and imbedded part of the health care curriculum because of the immersive and transformative learning experience it offers.

In designing CBE in the curriculum, a longitudinal scaffolded approach is advocated to enable adequate preparation for the challenges students may encounter.

The role of the clinical educator in CBE needs to be further investigated and framed, to clarify its distinct nature and to design learning activities that make the most of the opportunities that the CBE context offers.

Regular review of modules in the curriculum is advocated to ensure that learning opportunities and contexts are adequate to achieve the learning outcomes.

As this study focused on student perspectives, further research involving all stakeholders is required to investigate the impact of CBE.

Key: CBE, community-based education.

## ■ Conclusion

Community-based education provides unique learning opportunities based on the specific characteristics of the placement. The valuable and challenging learning opportunities that CBE provided facilitated students' personal, academic and professional development by fostering IPL and creating awareness of the influence of SDH. The nature of the learning activities, the learning environment and the organisation of the placement influenced learning. Further research is advocated to investigate the students' impact on community-based health care services.

# The International Classification of Functioning, Disability and Health Framework as a strategy to promote interprofessional collaboration during rural training in South Africa

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## ■ Abstract

**Background:** Interprofessional education (IPE) is a process of learning where different health care professions learn with, from and about each other to improve the quality of care and services. Despite being essential in health professions education, it is unclear how IPE is embedded in undergraduate (UG) student training. The International Classification of Functioning, Disability and Health (ICF) Framework is recommended to provide a shared language in health care and as a common care framework for health and social professions. There is a need to explore the impact of using the ICF Framework in collaborative clinical discussions on promoting IPE, which could offer insight into embedding IPE into existing curricula.

**Aim:** This study aimed to explore the perceived value of using the ICF Framework to promote IPE before, during and after students' clinical training in two rural settings in 2021.

**Methods:** A descriptive study was conducted at two rural clinical training sites where the ICF Framework was used during collaborative patient care discussions by students from various degree programmes in the health sciences. Whole population sampling was used, and participant responses were captured through an online open-ended survey questionnaire. Qualitative data relating to ICF exposure along the continuum of learning and the influence thereof on IPE were collected and deductively analysed. A structured matrix of analysis was developed using the definition of IPE as a theoretical framework.

**Findings:** The response rate was 30%. Participants reported that using the ICF Framework as an interprofessional team was more valuable as compared to using it in isolation. Continued use of the ICF Framework to promote interprofessional collaboration after exposure was reported by participants. This article highlights the value of a proposed IPE-ICF theoretical framework that can be used as a tool along the continuum of learning and as a guide on multiple platforms in health professions curricula to promote interprofessional education and collaborative practice.

**Conclusion:** Using the ICF Framework during collaborative interprofessional team discussions provides an opportunity to embed IPE into an existing curriculum. Recommendations include the introduction of the ICF Framework early during undergraduate and consistently throughout training in interprofessional groups, introducing the ICF Framework into clinical learning activities.

## ■ Introduction

Interprofessional education is an innovative academic response to prepare future health and social professionals to address the complex health challenges

in society (Filies, Yassin & Frantz 2016). Interprofessional education occurs when members or students of two or more professions learn with, from and about each other to improve collaboration and the quality of care and services (The Centre for the Advancement of Interprofessional Education [CAIPE] 2020). Traditionally, education in health and social care has been offered in structured and separate entities or disciplines that can promote power, competition and hierarchy rather than teamwork (Angelini 2011). The above approach may complicate training health professionals to collaborate (Pecukonis, Doyle & Bliss 2008). Ultimately, when discipline-specific UG education discourages cooperation, graduates struggle to work together in clinical practice (Bianchi et al. 2018).

Interprofessional education is required to support the development of interprofessional core competencies needed to work cooperatively to provide comprehensive, effective and safe patient/client/family/community care, thus enabling effective interprofessional collaborative practice (IPCP) (Gilbert, Yan & Hoffman 2010). Interprofessional collaborative practice occurs when multiple health workers from different professional backgrounds provide comprehensive services towards a common goal by working with patients, their families, carers and communities to deliver the highest quality of care across settings (Gilbert et al. 2010). Interprofessional collaborative practice can result in improved health care services and systems and ultimately improved health outcomes (World Health Organization [WHO] 2010). When IPE and IPCP are encompassed into one field of study, the term 'interprofessional education and collaborative practice (IPECP)' is used (Khalili et al. 2019). In the consensus report on health professions education in South Africa, Volmink (2018) described IPECP as a key component in the transformative approach to student learning and health system transformation and recommended the development of an IPE curriculum for health professions education in South Africa.

Despite the evidence that IPE promotes IPCP, it is often not integrated into the existing curricula or clinical training, perhaps because of the existing curricular constraints (Cahill et al. 2013; Cuff 2013). Barriers to the integration of IPE into curricula are well-documented and vary between institutions (Volmink 2018). Common barriers include issues of hierarchy, communication and different learning outcomes (McNaughton 2018; O'Leary et al. 2019). Careful curriculum planning is therefore required to ensure that IPECP is a core part of curriculum outcomes and learning activities in order to benefit from its rich learning and practice potential. For this reason, Volmink (2018) recommended the development of an IPE curriculum that can be embedded into existing or renewed curricula for health professions education from UG to postgraduate (PG) training (Pecukonis et al. 2008; Volmink 2018). It is necessary to explore new ways

of promoting IPE during UG training to capitalise on the well-documented benefits of IPCP in practice (Blue et al. 2010). This would require the inclusion of IPE without disrupting or adding to clinical or theoretical training in the existing curricula (Blue et al. 2010). Instead of adding a new and separate learning module, exploring opportunities where IPE can be facilitated during existing learning experiences is key.

Shared communication strategies and frameworks for patient management have been recommended as a curricular strategy to enhance team-based care as an essential core competency in IPE (Cahill et al. 2013; Rhoda et al. 2016). The International Classification of Functioning, Disability and Health (ICF) is one such framework that has been identified as a strategy to facilitate communication and promote collaborative engagement in the health care system and is recommended during undergraduate training (Moran et al. 2020; Volmink 2018). The ICF conceptualises the complex interrelatedness of functioning as a dynamic interaction between a person's health condition and environmental and personal factors (WHO 2001). A health condition is linked with personal and contextual factors, and as the context changes, so will the person's health care outcomes. Health and disability can, therefore, be considered a complex, multidimensional and dynamic experience. The ICF is therefore ideally suited to use as a framework to promote IPECP because it is a global tool that eliminates professional jargon and streamlines communication in health care.

The full ICF classification system not only creates a common language between professions at individual, institutional and societal levels about functioning and disability but also provides a coding scheme to facilitate data comparisons across settings or countries (WHO 2002). It was designed to provide a scientific basis for health-related research and as an infrastructure for data collection across countries, professional disciplines and services (WHO 2001). The ICF Framework has been officially approved by 191 member states of the WHO worldwide, including South Africa, as the international standard for measuring health and disability at both individual and population levels (WHO 2001). In South Africa, the ICF Framework is used by institutions of higher education to facilitate holistic understanding and management planning of persons with disability by health care professionals and health sciences students from more than one university (Kloppers et al. 2015; Müller et al. 2019; Rhoda et al. 2016). Apart from its clinical and research application, the ICF Framework has been identified and successfully used as a strategy to promote holistic patient management and interprofessional collaboration not only with UG students in South Africa (Allan et al. 2006; Jelsma & Scott 2011; Kloppers et al. 2015; Rhoda et al. 2016; Snyman, Von Pressentin & Clarke 2015) but also with clinicians working in the African public sector (Hall & Visagie 2020; Sagahutu 2018).

Using the ICF Framework in the context of interprofessional engagement may assist students and health professionals in identifying the challenges experienced by individuals and communities and the need for a collaborative team approach to care (Rhoda et al. 2016). Using the ICF as a conceptual framework to promote IPECP is advocated in the latest consensus report for health professions education in South Africa (Volmink 2018). This process of awareness or insight into the complexities of patient care derived from collaborative use of the ICF Framework during clinical training may facilitate individuals' insight into the value or even necessity of collaborating with other professionals to improve the health outcomes for client/family/community-centred care (Cahill et al. 2013; Jaffer, Africa & Waggie 2021; Moran et al. 2020).

Students using the ICF Framework during patient management at a district health clinic reported that positive interprofessional learning occurred and recommendations were made to explore the potential value of using the ICF Framework as a team to promote IPE (Kloppers et al. 2015). Using the ICF Framework to promote interprofessional learning is therefore not a new concept; however, understanding whether it results in the required IPE needed for IPCP still needs to be explored. Does using the ICF Framework during health sciences training enable IPECP? (Barr 2013; Khalili et al. 2019; Pettigrew 1998; Vygotsky & Cole 1978). This study aimed to explore students' experiences of using the ICF Framework before, during and after their involvement in a collaborative patient care project in South Africa. This study contributes to the body of knowledge by exploring if IPE takes place when students collaboratively engage with the ICF Framework during clinical training. This is necessary to explore the potential value of the ICF Framework in fostering collaboration among students from the health sciences, working towards developing a common goal to achieve the best outcomes for their patients. The study explores the value of using the ICF Framework in promoting IPECP before, during and after students' collaborative learning experiences on the rural training platform to guide the implementation of IPE in existing or renewing health care curricula. A better understanding of the perceived value of using the ICF Framework during undergraduate training in promoting IPE is fundamental to capitalising on the existing learning experiences.

## ■ Methods

A descriptive research design was followed, and data were collected by means of an open-ended questionnaire. A qualitative analytical approach in which participants' words were the unit of analysis was followed to understand students' perceptions of using the ICF Framework as a strategy to promote IPCP during the 2021 Ukwanda Collaborative Care Project (CCP), the details

of which have been previously published (Müller 2019). The definition of IPE (when members or students of two or more professions learn with, from and about each other to improve collaboration and the quality of care and services) (CAIPE 2020) was used as a theoretical framework to explore student perceptions about the value of using the ICF to promote IPE prior to, during and after their CCP experience.

## ■ Study context

The Faculty of Medicine and Health Sciences at Stellenbosch University (SUN) has adopted the ICF Framework for undergraduate health professions education across multiple programmes. Congruently, the ICF Framework is used to guide teaching and learning during interprofessional learning activities at the Ukwanda Centre for Rural Health. This study focuses on the influence of IPE using the ICF Framework during students involvement in the CCP (Müller 2019). The rationale and project details of the CCP are presented in Table 8.1, and they have been described in previous publications (Müller 2019; Müller & Couper 2021).

The ICF Framework was incorporated into the CCP in 2013 as part of a strategy to encourage health sciences students to evaluate patients holistically from a variety of disciplinary perspectives. This strategy aimed to promote collaboration with other disciplines to increase the health outcomes for client/family/community-centred care. Within the CCP, the ICF Framework was diagrammatically simplified and used as a tool to facilitate interprofessional patient management on the rural training platform (Figure 8.1).

<b>Body function impairment</b>	<b>Activity limitation</b>	<b>Participation restriction</b>	
<b>Environment factors</b>		<b>Personal factors</b>	
<b>Barriers (-)</b>	<b>Facilitators (+)</b>	<b>(-)</b>	<b>(+)</b>
<b>Team management plan</b>			

Source: Simplified table for teaching purposes at Stellenbosch University developed in partnership between Stellenbosch University and Western Cape Government Health, South Africa (Felix et al. 2017) based on the ICF Framework proposed by the WHO (2001).

**FIGURE 8.1:** Diagrammatic simplification of the International Classification of Functioning, Disability and Health Framework used as a tool during Collaborative Care Project to promote collaboration.

**TABLE 8.1:** The Ukwanda Collaborative Care Project.

<b>Item</b>	<b>Description</b>
Commencement	The CCP started in Worcester in the Western Cape province in 2012 and expanded to Upington in the Northern Cape province of South Africa in 2019
Rationale for the project	The project was introduced to promote interaction between different disciplines of students at a primary health care level. Students learn how to identify problems in the community that can benefit from referral plans to local resources. This in turn supports local underserved communities.
Duration of the activity	Sessions take place weekly throughout the year and can be up to 3 hours in duration. Students participate in 4-10 sessions during their training, depending on how long their clinical rotation is.
Location of the project	Started in Worcester (Western Cape) and expanded to Upington (Northern Cape), South Africa
Student groups involved some students attending weekly for six weeks, while others attended monthly for ten months	Occupational Therapy (final-year) Human Nutrition (final-year) Medicine (longitudinal† medical student interns - final-year) Medicine (short rotation‡ medical students from fourth, fifth or final year) Physiotherapy (final-year) Speech, Language and Hearing Therapy (final-year) Clinical Pharmacy from the UWC (MA students)
Explanation of the project	Students from any discipline present patients they are currently treating in the ward or community to a group of interprofessional health or social sciences students and professionals. The ICF Framework is used as a tool to promote interprofessional discussion and planning during which students collaboratively map the patient presentation onto the tool provided (Figure 8.1). Each student contributes information or asks questions relevant to the patient care based on their perspective and discipline role - asking questions and providing insight with the facilitation of a supervisor. More information from patient notes, contact with the patient or family, or via a home visit is gathered by the students who then agree on an overarching patient problem list. Management goals are identified and referrals or treatment plans are implemented by the team. Students are required to manage their patients as a team within the local health and social care system. Figure 8.2 provides an example of documentation of an interactive discussion using the ICF tool used during the CCP.
Role of the supervisor	The supervisor's role is to facilitate interaction between students from different disciplines, prompting discussion and challenging assumptions with questions aimed at promoting holistic patient assessment and intervention
Adaptations to the CCP as a result of the COVID-19 pandemic	A hybrid model of virtual and face-to-face CCP is an innovation that transpired because of COVID-19 lockdown restrictions in 2020 (Segar 2020). Participation in the CCP was made possible for students based in remote rural placements with no access to students or professionals from other disciplines via a Zoom™ conferencing facility. This enabled them to present their patient cases to an interprofessional team and collaborate with them regarding appropriate management. Members of the interprofessional team could also join a home visit or patient consultation remotely via a Zoom™ video conference call.

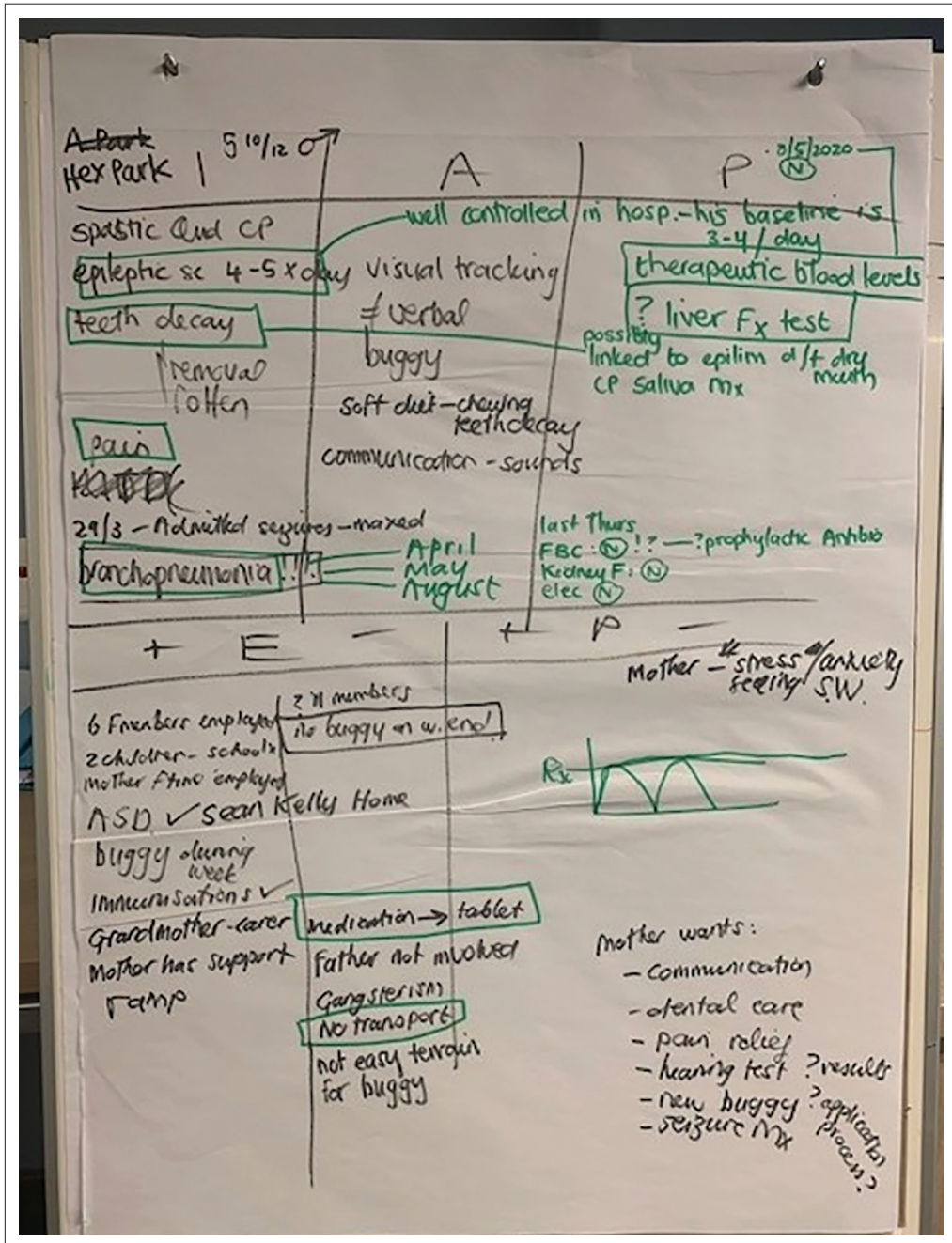
Source: Müller (2019).

Key: ICF, International Classification of Functioning, Disability and Health Framework; UWC, University of the Western Cape; MA, master's degree; COVID-19, coronavirus disease of 2019; CCP, Collaborative Care Project.

†Longitudinal medical student interns spend their entire final year (10 months) training at the rural site.

‡Short rotation medical students spend between six- and ten-week training at the rural site.





Source: Photograph taken by Jana Müller on 16 August 2021, 3.24 pm. Used with permission from Jana Müller.

**FIGURE 8.2:** An example of the International Classification of Functioning, Disability and Health Framework tool used during the Collaborative Care Project by an interprofessional group of students.

It is evident from previous research on the CCP that students engage in IPCP during the sessions by using the ICF Framework (Müller 2019; Müller & Couper 2021). The question of what learning is taking place during these sessions and what effect it has on students' practice outside the CCP is what guided this research study.

## ■ Population and sampling

A total of 159 students participated in the CCP in either Upington or Worcester during 2021 and were included in the study population. The breakdown of students' involvement per discipline can be found in Table 8.2. Participants included students who were on site and those who joined the interprofessional team virtually via Zoom™ video conference from a remote rural site or from the University of the Western Cape (UWC) School of Pharmacy. Students who were repeating their academic year or who had not attended any of the CCP sessions were excluded from the study because the CCP differed from year to year. Students may have had prior exposure to the ICF Framework in their respective programmes, either during foundational theoretical modules or clinical training prior to participating in the CCP.

## ■ Instrumentation

Ethical approval to conduct this research was obtained from the SUN's Social and Behavioural Research Ethics Committee (Ethics reference number SBR-REC 23021). Data were collected by means of an open-ended survey questionnaire designed by the authors using the Research Electronic Data Capture (REDCap version 9.1.2, Creator Vanderbilt University, Nashville, TN, United States of America [USA]) (Harris et al. 2009). The researchers divided the questionnaire into three main sections to help them understand student perceptions before, during and after the CCP using the ICF. Each of these three sections, in turn, was based on the definition of IPE to determine how students learnt with, from and about each other while using the ICF Framework. The questionnaire was validated through face validity. According to Tsang et al. (2017), face validity refers to the extent to which the participants consider the questionnaire items to be valid. Such considerations are not based on the technical components of the questionnaire items but rather on the extent of meaningfulness to the participant. The advantage of using face validity is that it motivates participants to answer more truthfully.

The first section of the questionnaire centred on prior exposure to ICF. This was to determine if students knew about the ICF before entering their clinical placement, if they received any theoretical teaching on the topic or if they applied the ICF Framework while managing a patient. The second section of the questionnaire was based on students' experiences of the ICF



during the CCP; what they learnt from, with and about each during the IPE activity; and the impact it had on patient management.

The third section was to determine if the students made use of the ICF Framework outside the context of the CCP. The students were prompted to elaborate on where they used it, if it included students from other disciplines and whether they saw value in continuing to use the ICF Framework. Again, in this section, students were asked whom they continued to learn with, from and about, as per the IPE definition.

The structure of the questions in the design of the questionnaire allowed the researchers to conceptualise a matrix for data analysis (Appendix 2) incorporating the elements mentioned above, that is, aspects of the IPE definition, prior exposure to, exposure during and use of the ICF after the CCP, the competencies being developed and how this may have contributed to collaborative practice.

## ■ Data collection

All eligible students who participated in the CCP across all programmes throughout 2021 were invited to participate in the study in order to gather perspectives from all disciplines to enhance the credibility of the data collected (Creswell & Poth 2018). Invitations to participate in the study were distributed via email and WhatsApp messages by Jana Müller in October 2021 and one WhatsApp and two email reminders were sent out to students who had not yet completed the questionnaire between 12 and 31 October 2021. The messages included a link to the open-ended survey questionnaire, which provided further information and included an invitation to participate in the research study and an electronic consent form. Participants were required to complete an electronic informed consent form before gaining access to the questionnaire (Appendix 2). All participants were informed that their participation was voluntary and that they had the right to withdraw from the study at any stage without any consequences to themselves or their academic performance. Demographic and qualitative data about participants' exposure to and experience of using the ICF Framework prior to, during and after the CCP were collected using the survey questionnaire. REDCap automatically assigned all participants with a unique code identifier to ensure anonymity on all the data sets.

## ■ Data management

All data were securely stored on a password-protected electronic storage cloud accessible only by Müller, which will be destroyed after a period of five years. None of the data generated from this research will be used for any other study.

## ■ Data analysis

The definition of IPE (CAIPE 2016) was used as a theoretical framework to explore existing learning experiences of health sciences students where the collaborative use of the ICF Framework during clinical training had been implemented to promote IPCP. A structured matrix for analysis was developed by Gérard C. Filies taking into consideration the core concepts of this study, that is, the definition of IPE, the structure of the ICF Framework and the interprofessional core competencies in health care (integration of knowledge, skills and values/attitudes) (Interprofessional Education Collaborative Expert Panel 2011). The matrix facilitated pattern recognition during deductive content analysis, helping to identify similarities, contradictory data, repetitive information or no information provided by participants (Gale et al. 2013) (Appendix 3). Deductive content analysis (Vaismoradi, Turunen & Bondas 2013) was done independently by both researchers using this matrix. Each researcher read, re-read and analysed all the data individually first. They then presented their findings to one another with respective quotes allocated to the themes within the matrix of analysis. An iterative process of data comparison and alignment with research aims was done twice during the analysis phase of this study. Comparative analysis of research findings to explore differences and similarities in the respective researchers' interpretation and presentation of the data was done to enhance the credibility of the findings (Korstjens & Moser 2018). Discussion and consensus relating to the separate findings allowed for triangulation during the data analysis process. Quotations were chosen independently by the two researchers and then compared afterwards for inclusion to ensure that the perspectives of participants across the different disciplines were represented in the reporting of the findings.

## ■ Trustworthiness

Holmes (2020) stated that positionality is normally identified by locating the researcher in three areas, namely: (1) the subject under investigation, (2) the research participants and (3) the research context and process (Holmes et al. 2006). The positionality of Müller to the CCP and the expertise and critical lens offered by Filies enhanced the trustworthiness of the data analysis process. Investigator triangulation ensured the trustworthiness of the data as two researchers were involved in data analysis in the same study for confirmation purposes (Hussein 2018). In alignment with Frambach et al. (2013), credibility was ensured through member checking by asking the research participants to give feedback on the data collected and if the interpretation of the data was correct. Transferability was ensured by the researchers by giving thick descriptions of the findings and explaining the context of the rural sites in detail. By continuously re-examining the

data and using new insights that emerged during analysis, the researchers ensured dependability. Researcher biases were mitigated by constantly searching the literature for evidence that disconfirms the findings were true (confirmability).

## ■ Positionality

The researchers have knowledge and a broad range of experience in IPE. Filies has been directly involved in the design of the IPE curriculum at the UWC. The co-author Müller, a physiotherapist with previous clinical exposure to using the ICF, has nine years of experience working with the design, implementation and facilitation of IPE student activities on the rural training platform of SUN. Müller coordinates and facilitates the Ukwanda CCP in Worcester. She is not involved in any student assessment. Filies provided critical reflection and an external interpretation of the findings as an impartial expert in the field of IPE with no involvement with any of the participants or in the CCP.

## ■ Findings

The findings comprise a description of the participants and a provision of the main themes of the study. The response rate was 30% ( $n = 48$ ), representative of all the discipline groups who were exposed to the CCP in either Upington or Worcester during 2021. The number of participants per discipline, year, level of study, total number of participants exposed to CCP, average number of sessions attended per student, number of responses, as well as the key for abbreviations used in the findings are provided in Table 8.2.

**TABLE 8.2:** Study population, distribution of study participants and key used in findings.

Discipline	Year	Total number of students exposed to CCP	Average number of sessions attended per student	Number of responses
Clinical Pharmacy (CP.2021)	PG (MA)	4	10	4
Physiotherapy (PT.2021)	Final year	30	10	8
Occupational Therapy (OT.2021)	Final year	15	12	8
Human Nutrition (HN.2021)	Final year	4	8	2
Speech-Language and Hearing Therapy (ST.2021)	Final year	35	12.5	11
Medical students – short rotation (Mlate.2021)	Fifth year	11	7.5	4
Medical students – short rotation (Mmid.2021)	Fourth year	39	4	5
Medical student interns – longitudinal (MSI.2021)	Final year	21	9	6
<b>Totals</b>	<b>-</b>	<b>159</b>	<b>-</b>	<b>48</b>

Key: CCP, Collaborative Care Project; PG, postgraduate; MA; master's degree.

The qualitative findings are presented under the three predetermined themes and categories that are in line with the structured matrix of analysis used during the analysis process. The three predetermined themes are given as follows: (1) Prior use of the ICF Framework before participants' involvement in the CCP, (2) experience of using the ICF Framework during CCP and (3) the use and intended use of the ICF Framework after CCP. The quotes (number and length) were chosen to best represent the study findings (Polit & Beck 2016). The participant codes for each quote are linked to the particular discipline they represented to show that the responses were interprofessional in nature, followed by a number to indicate the number of participants for any given discipline.

### ■ **Prior exposure to the International Classification of Functioning, Disability and Health Framework**

In this section, the researchers want to find out how many of the students had prior exposure to the ICF before their involvement in the CCP in Worcester or Uppington. The researchers also wanted to know if they received any theoretical teaching about the ICF as part of their undergraduate curriculum. In addition, if they ever used the ICF as a practical framework in patient management before the IPE activities mentioned above, and if so, when and in what context did they use it? This section then concluded with an open-ended question for the students to comment on their experience if they had used it before. Most participants reported having had exposure to either theoretical training or practical use of the ICF Framework at some point during their undergraduate training prior to their participation in the CCP. The following responses from participants confirm having prior exposure to the ICF:

'Yes, during my course it has been used multiple times.' (ST10, 2021)

'Used it in my third year [...] online.' (OT2, 2021)

'During our first year of MBChB we were rudimentary introduced to the ICF form. Our knowledge was then expanded during the third year [...] this being said, during collaborative care it was the first time we had encountered the ICF as a working document and used it as a tool to further manage pts.' (Mmid3, 2021)

When considering the value of previous exposure, many of the students reported that they valued having prior exposure to the ICF, which meant they knew how to apply it at the clinical training site. This is evident in the following quote:

'The ICF was very useful and gave a clear understanding of the patient in totality.' (OT1, 2021)

On the contrary, there were also students who had a negative perception of the ICF. This was evident in the following quote:

'We had a case scenario [...] and had to fill in the ICF however, I would not say I learnt much about it.' (Mmid5, 2021)

'We were already introduced to ICF in first year, but it's only now that I've seen how it gets utilised practically.' (MSI4, 2021)

The nature of these previous experiences with the ICF included examples of using the ICF Framework with case presentations within their own disciplines to understand the complexities of patient wellness and to plan a comprehensive management plan. These findings are supported by the statements from the participants:

'We used it as part of our case presentations.' (ST3, 2021)

'I feel like it helps to focus my management very holistically and functionally. It is easy to use and assists in directing my focus points.' (PT1, 2021)

The main findings were that the majority of the students had prior exposure to the ICF and that they saw the value in using this framework. They tended to use the ICF in case presentations and a smaller percentage of the students did not see the value of having prior exposure. Only the CP students indicated that the CCP was the first experience they had in using the ICF.

## ■ The experience of using the International Classification of Functioning, Disability and Health Framework during the Collaborative Care Project

In this section, the researchers wanted to find out the following from students: their experiences using the ICF during the IPE activity they participated in during 2021; an explanation of what they learnt with other disciplines when applying the ICF during their clinical training; what they learnt about other disciplines when using the ICF; what they learnt from other disciplines when using the ICF; and how using the ICF influenced their approach to patient evaluation and management.

Respondents indicated that there was additional value in using the ICF Framework as an interprofessional team during the CCP compared to their previous experiences of working within their own professional silos only. Not only was a more comprehensive picture of the patient possible with interprofessional team members contributing to the ICF Framework but also the tool aided communication and goal setting between students. By using the ICF Framework during the CCP, the students' approach to managing patients changed in that they had a more holistic picture of the person. The following quotes are illustrative of the respondents' notions:

'Collab[orative] care is the first platform where we actually use the ICF in real depth with real-life patients to critically discuss all the factors relating to the ICF and the patient.' (ST6, 2021)

'I learnt that all disciplines use different assessments and have different interventions but when using the ICF, the information is presented in a way that makes it easier for everyone to understand the value of everyone else's roles.' (OT7, 2021)

'It helped me to understand the value of ICF implementation even more, especially seeing it from others' perspectives, where before I would be working on it individually. Possibly hearing someone mention something that I typically wouldn't think is a factor for the patient.' (PT4, 2021)

Together with an interprofessional approach to learning, the biopsychosocial approach to patient management resulted in a positive change in attitude to working with students from other disciplines. This was evident in the following quotes:

'It helped me to understand the value of ICF implementation even more, especially seeing it from others perspectives, where before I would be working on it individually.' (PT3, 2021)

'It has made me realise that I must not be scared to ask [...] and understanding one another is the best way to achieve improved patient outcomes.' (HN1, 2021)

'It has made me really excited to work with other disciplines and to see how their influence is beneficial to the patient.' (ST11, 2021)

'I learnt that we can rely on one another to complete the picture of the patient and we cannot always know everything when it comes to the patient and the care.' (MSI6, 2021)

The most important lessons learnt *with* an interprofessional team are supported with the following quotes from participants:

'How effective collaboration can be in patient care.' (PT4, 2021)

'The importance of communication and treatment goals for the patient being treated.' (PT7, 2021)

'Each discipline has a specific focus and without collaboration it could be possible to miss these aspects.' (CP4, 2021)

'How to prioritize issues and seeing how we can solve the smaller yet very important matter first.' (MSI5, 2021)

Lessons learnt *about* other members of the team are illustrated in the following quotes:

'Everyone has their own role to play and I learnt where all the other disciplines can help me.' (HN1, 2021)

'I think I got a better understanding of what their focus is and what aspects they can work on and help with.' (OT3, 2021)

'I learnt which things are the role of which team member. Also, what is important information to ask the patient that will help other professionals.' (ST4, 2021)

'They have so much more knowledge and insight about certain topics that's relevant to me as a doctor as well, especially some concepts that I still struggle to grasp.' (Mmid4, 2021)

Lessons learnt *from* the interprofessional team are highlighted these quotes:

'The different types of assessments they do in their practice.' (CP3, 2021)

'Other disciplines interpret the same information differently according to their scope of practice.' (OT7, 2021)

'They also helped me with resources to use since I'm in the periphery and there were limited allied health services thus, patients could still get some sort of treatment from me because of the notes they gave me.' (MSI5, 2021)

'Learnt a lot of new terminology used within the different professions and the different areas which can be assessed and managed by the different professions.' (ST6, 2021)

'I learnt the importance of the social aspect to treatment. Sometimes we forget simple things like access to resources.' (ST4, 2021)

'I learnt about the importance of home visits and understanding a patient's context in the overall outcome of the patient. The other disciplines showed me how important that is.' (MSI3, 2021)

By using the ICF, it resulted in changes in practice by the students during the IPE activity. They made the following comments in light of this category:

'Think more long-term regarding patient outcomes. That after discharge there is still a lot of work to do.' (Mmid2, 2021)

'To make a differential diagnosis that does not only include their physical symptoms. It also helped me to work out a management plan that is specific to the patient and not something that I could copy and paste from a previous patient.' (ST11, 2021)

'Made me see a much larger picture as patient management goes much deeper than what is seen at surface level.' (HN1, 2021)

'Think broader in terms of how a diagnosis can affect their lives. It also taught me to engage with other disciplines to ensure optimal patient care.' (MSI6, 2021)

'I will pay better attention as to how I conduct my referrals so that I give the best handover information I can.' (Mmid4, 2021)

'As a person with anxiety, it's difficult for me to ascertain what can be done/solved now, so by the use of the framework it shows a picture of perhaps where I could start.' (MSI5, 2021)

The students' experience of using the ICF during the IPE activity revealed that it was a meaningful experience for them. They valued the fact that it allowed them to see the patient/client more comprehensively during the assessment period. They further felt that it contributed to more effective communication between team members, and this resulted in more effective goal setting for the patient/client.

## ■ The use and intended use of the International Classification of Functioning, Disability and Health Framework after participation in the Collaborative Care Project

Under this theme of the study, the researchers wanted to establish if the exposure to the ICF during 2021 influenced the participants' approach to working with students from other disciplines; if there were other opportunities where they used the ICF Framework since their experience in the CCP; asking them to predict ways in which they could use the ICF in the workplace after graduating; establishing whether they continued working with students from other professions since the CCP; ways they have continued to learn from students from other professions; and ways they have collaborated with other professions during patient evaluation or management since the CCP.

There were several participants who reported having the opportunity to make use of the ICF Framework. These were evident in the following quotes:

'[I]n patient care every day.' (ST7, 2021)

'[Some spontaneously] when doing referrals to allied health.' (Mmid2, 2021)

Other students continued to use the ICF as part of an assessment process during hospital ward rounds and during consultations with patients. Some participants expressed their feelings as follows:

'I felt comfortable to reach out to other health care professionals and encourage undergraduate pharmacy students to collaborate with other health care professionals.' (CP3, 2021)

While others:

'[C]ollaborated together on patients and made sure that we treated the patient as a team.' (ST7.2021)

Active engagement in collaborative patient care was evident in some responses, with a sense of agency and advocacy for improved patient outcomes. This was supported by the following participant quotes:

'The patient was discussed at the local clinic, and I organised with the speech therapist to go on a home visit to better understand the situation at home and eating patterns or availability of food.' (HN2, 2021)

'[E]xplaining to the med[ica/] students about the purpose of the ICF and it creates the perfect picture of the person in the hospital and for thrashing out complex patient pictures and collaborative goal setting.' (PT7, 2021)

There was explicit intent by participants to use the ICF Framework to promote IPCP after graduation and ways in which to action that are detailed by the following participant quotes:



'I would like to implement this tool in the facility in which I work to improve the interprofessional collaboration.' (CP4, 2021)

'I would like to use it in staff meetings or patient management planning in meetings.' (HN2, 2021)

'Using it to structure and guide my therapy during community service and beyond.' (OT8, 2021)

'I can see myself using it in patients that are very complex and require a lot of input [...] to assess all areas to determine what the cause of the problem may be.' (MSI3, 2021)

'Definitely assisting me in prioritizing my long-term management plan for patients.' (MSI5, 2021)

'I can use the ICF as a referral template to the rest of the multidisciplinary team and also as a detailed discharge summary.' (MSI6, 2021)

'When working with patients, while working with undergraduate and postgraduate students in the facilities.' (CP3, 2021)

'In practice, I doubt I'll physically complete the ICF but I will know when a patient [...] will require input from the other disciplines.' (Mlate4, 2021)

'Not sure, will depend on department I work in's modus operandi preferences.' (Mlate3, 2021)

From the findings, it is evident that participants found value in using the ICF Framework collaboratively as a team, as this enabled them to learn with, from and about each other as well as to approach patient management more holistically. The practical implementation of the ICF Framework appears to be a tool that participants could see themselves using after graduation, which warrants further investigation.

## ■ Discussion

There have been many publications advocating for the use of the ICF as a conceptual framework to facilitate IPECP. This is the first study, to our knowledge, that has explored what learning is taking place while using the ICF Framework as a teaching tool during collaborative patient care learning opportunities such as the CCP. It is clear from the findings that students are able to learn with, from and about each other to improve patient care planning when they use the ICF Framework collaboratively as a team. Interprofessional education is not evident when the ICF Framework is used in isolation from other disciplines, and therefore, IPCP is not a feasible expectation from students using the ICF. The implications of this are that educators can leverage environments where the ICF Framework has already been implemented as a learning tool in order to introduce IPE into existing curricula as long as students from two or more professions work together.

Previous research has evidenced that the ICF Framework promotes clinical reasoning and a holistic approach to patients in their context (Jelsma

& Scott 2011) while challenging the notion of siloed health care provision and enhancing collaborative leadership (Snyman et al. 2015). This study, however, demonstrates the perceived value of using the ICF Framework by an interprofessional team more widely than within a specific health sciences discipline as part of the process of achieving IPECP. Our findings support the notion of Kloppers et al. (2015) that the ICF Framework holds greater potential as a tool for IPE when used by an interprofessional team of students in the clinical setting (Kloppers et al. 2015).

In the previous research, the CCP has demonstrated the value of the ICF Framework to help students identify unaddressed primary health care (PHC) issues and therefore improve patient care through referral along the necessary care pathways (Müller et al. 2019). Overall, students found the ICF Framework very useful as an assessment tool to better understand their patients and to plan effective intervention strategies. The trajectory of learning that was reflected on before, during and after exposure to the CCP demonstrates that using the ICF Framework facilitated the objectives of interprofessional learning. Respondents explicitly noted the value of using the ICF Framework with students from other professions, which opened their eyes to the complexity of patients and the value of the ICF Framework in patient assessment and management. The very act of using the ICF Framework during patient assessment as a health care team was reported to not only enable learning with, from and about each other but also improve patient outcomes through participants' increased understanding and experience of the importance of collaborative care, resulting in improved patient outcomes. These findings confirm the notion of a shift in paradigm towards an interprofessional perspective when it comes to approaching comprehensive health care (Snyman et al. 2015).

As IPE is required for IPCP and IPCP is a prerequisite to comprehensive, safe and effective health care (WHO 2010), including IPE in the curriculum should be commonplace. Yet, we know it is fraught with challenges (Blue et al. 2010; Bogossian & Craven 2020; Julie et al. 2016). It is evident from our findings that IPE can be facilitated by including the ICF as a common framework – already globally accepted by 191 international member states – into students' clinical training (WHO 2010). Our findings support the theory that facilitating students' collaborative assessment and management of patients in the clinical setting using the ICF Framework as a team enables effective IPE. The ICF Framework has value in encouraging students from different programmes to engage around a patient as an interprofessional team in the clinical setting, as this is often not the case in practice (Jaffer et al. 2021). Training students in rural environments has been shown to be ideal for IPE because of the smaller, more intimate nature of the environment (Spencer et al. 2015). However, studies have shown that IPCP does not just happen organically in rural environments (Gum et al. 2020; Mpofu et al. 2014). The authors suggest that the inclusion of the ICF Framework into clinical practice can change this.

A study done by Sagahutu (2018) explored how using the ICF as a conceptual framework informed interprofessional assessment and management by health care professionals working in rural hospitals in Rwanda. The results obtained by analysing patient notes before the training and two and six months afterwards demonstrate that a one-day training programme using the ICF Framework resulted in improved interprofessional engagement and management of patients at these hospitals (Sagahutu 2018). This is exciting evidence for the African context because of challenges with human resources for health, complex social determinants of health and the need for graduates who work collaboratively (WHO 2016). Our findings show that even participants who had no prior exposure to the ICF (master's in CP) found value in using the framework to obtain a comprehensive picture of the patient with the insight of their interprofessional team. Introducing the ICF Framework, despite it being new to some clinicians working in the health care system, clearly has the potential to encourage comprehensive care. The envisioned collaborative patient care as a result of using the ICF Framework would provide a positive model for our students' learning and potentially improve services offered by the health care system. It has been suggested that a critical pedagogy of place underpinning rural health professions education is unique in producing graduates who are more likely to act as social agents of change (Reid 2011).

## ■ Recommendations

The authors make the recommendations for education and clinical practice based on the findings of this study in Box 8.1.

## ■ Towards a theoretical framework

Moran et al. (2020) proposed that there are three stages to designing, building and evaluating the implementation of an ICF-informed curriculum that supports IPECP. The researchers in this study have added the three components of the definition of IPE to these stages to formulate a proposed theoretical framework to further promote IPECP.

In Figure 8.3, Moran et al.'s (2020) Stage 1 (developmental and integrated curriculum design) can be seen as the 'theory' aspect of competency development, where students are taught about the ICF before exposure to clinical practice. Moran et al.'s (2020) Stage 2 (build learning experiences and programmatic assessment across the curriculum) indicates the opportunity for students to apply the ICF Framework during interprofessional clinical patient care (projects like the CCP). Stage 3 (research and evaluation) of Moran et al. (2020) is comparable to the 'after exposure' component of the research study to determine if students' attitudes towards the ICF had changed to the extent that they continued using it outside collaborative

**BOX 8.1:** Recommendations for practice.

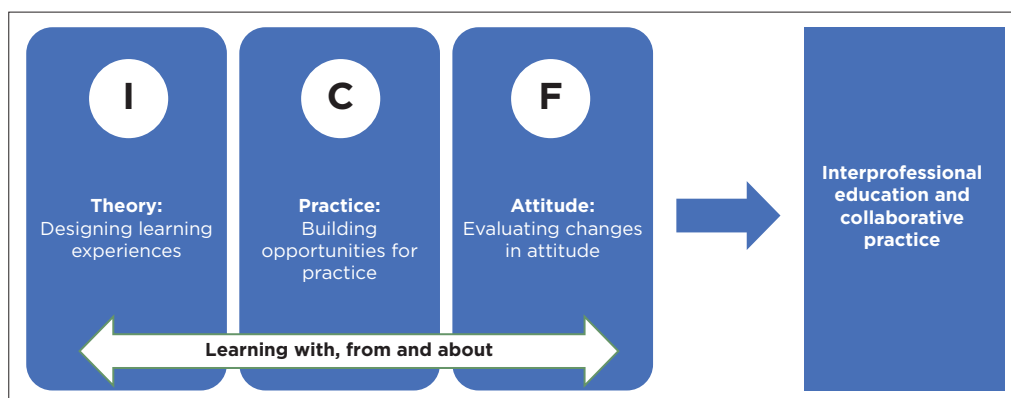
Introducing a common assessment and management planning tool like the ICF Framework into clinical learning spaces (hospitals, clinics and community) allows students to engage in IPE and influences the practice of clinicians working in the health care system. It also has the potential to promote IPE in clinical practice without it having to be seen as an add-on to an already full curriculum. The potential also exists to significantly improve the health outcomes for patients/families/communities in rural settings. Students have the opportunity to be agents of change by introducing a patient management framework in the health system. The introduction of a common framework will help equip and capacitate the clinician role models our students so desperately need to learn and assimilate the principles of IPECP (Blue et al. 2010; Julie et al. 2016; Müller & Couper 2021; Treadwell & Havenga 2013).

Introduce the ICF Framework during early undergraduate training and scaffold student learning throughout the curriculum to enable IPE and, subsequently, IPECP. This approach is in line with recommendations by Volmink (2018) and Moran et al. (2020). Having the ICF Framework as a learning tool to promote comprehensive and collaborative patient management and interprofessional education in the clinical setting will alleviate an additional IPE teaching workload for clinicians in an overburdened health care system, as is the case in many African contexts.

Students should engage in the ICF Framework as an interprofessional group of students or professionals to optimise their learning potential. This will result in a change in attitudes about themselves and other health and social science disciplines and provides a transformative learning experience. This in turn may yield the potential to result in a change in clinicians' attitudes, behaviour and practice, and thereby change in the health system.

A common practice framework should be adopted by faculty and used across disciplines to inform specific teaching and learning strategies and outcomes for IPE to be integrated into curricula (Julie et al. 2016). By doing this, there is potential for institutions offering health professions education to facilitate a change in siloed health care provision in the African context (Snyman et al. 2015).

Key: IPE, interprofessional education; ICF, International Classification of Functioning, Disability and Health; IPECP, interprofessional education and collaborative practice.



Source: Authors' own work.

Key: ICF, International Classification of Functioning, Disability and Health.

**FIGURE 8.3:** Interprofessional education and International Classification of Functioning, Disability and Health theoretical framework.

clinical learning opportunities (after the CCP). If students from a variety of disciplines traverse these three stages of learning as an interprofessional group, opportunities for 'learning about', 'learning with' and 'learning from' will be possible during their training without disruption to the existing curriculum.

## ■ Limitations

This research reports on data from participants' experiences at two rural clinical training sites in South Africa (Worcester and Upington). There are, undoubtedly, many other contexts where the ICF is used interprofessionally in a clinical setting. The study findings may be useful in similar environments where the ICF Framework could be introduced into clinical learning. A 30% response rate was another limitation in the study, as a bigger participant group could yield much more in-depth data to further support the findings. The use of an online survey questionnaire allowed for ease of data collection during this time of the COVID-19 pandemic and for the inclusion of students who had previously rotated through the CCP. However, the authors acknowledge that focus group discussion (face-to-face or via ZOOM™), where students could reflectively engage around their experiences, could have allowed for richer data collection. Students could have prompted one another during their focus group reflection to remember facets of their experiences they may not have considered when completing the online questions (Leung & Savithiri 2009). The proposed theoretical IPE-ICF Framework by the researchers helped to conceptualise the findings and discussion of this study but will require a rigorous scholarly interrogation of the methodology to explore the potential thereof. This can be done by using iterative cycles of reflection among experts to ensure it is comprehensive and depicts the key concepts and influences correctly.

## ■ Conclusion

This study has highlighted the value of students making use of the ICF Framework as an interprofessional team in the development of IPECP. The proposed IPE-ICF theoretical framework can be used as a tool at various stages of students' training as a guide to integrating the ICF Framework on multiple platforms in health professions curricula to promote IPECP. The integration of the ICF Framework as a collaborative teaching strategy in health professions and social science education can be a transformative tool for building a critical mass for IPECP in higher education. However, there is a need for further exploration of interprofessional core competency development while health and social sciences students engage in collaborative patient care using the ICF Framework during clinical training to unpack the richness of learning that is taking place. The resultant change in attitude regarding the ICF Framework and intentions to use it in future practice could be a good predictor of IPCP once students have become graduates. This, however, will need to be explored.

## **THEME 4**

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# **Curriculum renewal**



# A scoping review of the current literature and terminology used in the education of speech-language pathologists regarding service delivery across cultures

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## ■ Abstract

**Background:** Speech-language therapy should be responsive to the language and culture of the individual client and their caregiver(s). A clear, formal curriculum is required to prepare speech-language pathology students to work effectively and respectfully with clients from a range of cultural backgrounds. This study contributes to the body of knowledge for designing and implementing such a curriculum.

**Aim:** The purpose of this scoping review was to map the current literature on the education of cultural capabilities in the profession of speech-language therapy, including pre-service education and professional development activities. The focus was on the terminology and definitions used in the literature to refer to the clinician's ability to work effectively and respectfully with clients from a variety of cultural groups.

**Methods:** The scoping review methodology of the Joanna Briggs Institute was followed, and the PRISMA-ScR checklist was adhered to. Seven electronic databases and Google Scholar were searched for sources of information published from 2010–2021, with the final search performed in May 2021.

**Findings:** Eleven journal articles were included in the review. All of them originated from North America. The term most frequently used was cultural competence, and the various authors treated it without controversy. The most important aspects of the definition of cultural competence were that it includes knowledge, attitudes and skills and that it has been developed over a lifetime of dedicated learning and reflection. It also includes an understanding of the socio-economic factors that impact clients' daily lives.

**Conclusion:** Literature on the education of speech-language pathologists regarding service delivery to culturally diverse populations is scarce. Cultural competence is the term most used to refer to the ability to work effectively across cultural boundaries. Research is needed on how best to educate for cultural competence, including in the South African context.

## ■ Introduction

Speech-language therapy should be contextually relevant (Health Professions Council of South Africa [HPCSA] 2019). This means that all assessment, therapy and counselling need to occur in a manner that is respectful of the cultural, linguistic and experiential background of clients and their caregivers and responsive to their needs. Contextually relevant intervention is a requirement for fair and unbiased opportunities for all people in need of speech-language therapy to receive services that will enable them to communicate to their full potential, following their needs and preferences.

Cultural and linguistic diversity (CALD) is a term that indicates that a population consists of a variety of cultural groups (Speech Pathology Association of Australia Limited 2016). A comprehensive perspective on culture acknowledges that it is context-dependent and dynamic in nature. It acknowledges that individuals are exposed to and belong to several cultures, related, for instance, to where they grew up, lived, worked and socialised, as well as their education and whether they practise a religion. Many of these influences change over time as a function of context. An individual's culture should not be seen as comprising a single identity, but rather as a rich mixture of various influences and values, including 'ethnicity, race, age, income, education, sexual orientation, class, abilities, faith and more' (Yeager & Bauer-Wu 2013, p. 12).

Speech-language pathologists (SLPs) throughout the world have (often growing) caseloads consisting of individuals from diverse cultural and linguistic backgrounds (Verdon, McLeod & Wong 2015). Their socio-cultural and linguistic backgrounds will likely differ dramatically from at least a portion of their clients and their caregivers. This is certainly true of the South African health care and educational contexts. South Africa is a country with rich cultural diversity and eleven official languages (RSA n.d.). The people of South Africa are known as the rainbow nation (South African History Online n.d.). Speech-language pathologists (still) constitute a small group of professionals that is fairly homogenous in terms of gender, language and race – being mostly female, Afrikaans- or English-speaking and white. This is because of exclusions based on race in higher education training programmes during the apartheid years (Khoza-Shangase & Mophosho 2021). Substantial efforts are necessary to transform the demographic composition of the student body and are underway at all universities. South African SLPs are likely to be aware of the legal and human rights of their clients to express themselves and to receive services according to their language of choice and in a manner that respects and is appropriate for their cultural background. Yet, these SLPs are likely to 'experience day-to-day challenges in their practice not knowing how to work with clients with whom they do not share a common language or cultural frame of reference' (Pascoe et al. 2018, p. 2).

There are other characteristics of South African society that further complicate health care delivery. South Africa is infamously known as the most unequal society in the world, as measured by the Gini coefficient last measured in 2014. This inequality can be attributed to the legacy of exclusion during the apartheid era, as well as economic growth that is not pro-poor and does not lead to sufficient job creation (The World Bank in South Africa 2021). These economic and social difficulties have been exacerbated by the coronavirus disease of 2019 (COVID-19) pandemic, which has led to a decline in economic growth and further job losses. The official unemployment rate for the third quarter of 2021 was a dismal 34.9% (Statistics South Africa 2021). The inequality that characterises South Africa is also evident in its health care

system, a system that is also highly unequal. Approximately 84% of South Africans make use of services offered within the public health care system, while only 30% of the country's doctors are employed in this sector (Mayosi & Benatar 2014). Clients who live in poverty often have low levels of education and have poorer access to quality health care (Attrill, Lincoln & McAllister 2017; Cassel & Edd 2016). Socio-economic and power differences are, therefore, likely to exist between clinicians and their clients, especially in the public health care sector. Such inequality creates barriers to effective clinician-client communication and health care delivery (Penn & Watermeyer 2018) and can further complicate health care encounters where cultural differences exist between the client and the health care provider.

According to the Professional Board for Speech, Language and Hearing Professions of the HPCSA (2019), the education of SLPs should prepare them to provide contextually relevant and culturally responsive services and to embark on the process of lifelong learning about cultural, linguistic and other forms of diversity. South African speech-language therapy training programmes need to respond to this directive. However, limited knowledge exists about how students in speech-language therapy develop the ability to work cross-culturally (Howells, Barton & Westerveld 2016), and few resources exist to guide educators in facilitating the acquisition of such educational outcomes (Matteliano & Stone 2014). Furthermore, knowledge and experience regarding teaching cultural competence to speech-language pathology students in high-income contexts will need to be adapted and expanded to inform educational efforts in South Africa. As a first step towards designing and implementing a locally relevant curriculum aimed at developing students' 'cultural capabilities' (Attrill et al. 2017, p. 311), a scoping review of the applicable international research literature was undertaken. 'Cultural capabilities' is used as a generic term to refer to the clinician's ability to work effectively with clients from different cultural groups.

The purpose of this scoping review was to map the current literature on the education of cultural capabilities in the profession of speech-language therapy, including pre-service education and professional development activities. The review was focused on identifying the specific terminology and definitions used in the literature to describe cultural capabilities targeted within speech-language pathology curricula and continued professional education. It was deemed an appropriate starting point for curriculum planning as it is necessary to identify, understand and evaluate what the concepts are around which such a local curriculum should be built. The research question that the scoping review wanted to answer was thus: What is the scope and nature of the current literature on the education of SLPs regarding service delivery across cultures, and what terminology is used to refer to the clinician's ability to work effectively with clients from different cultural groups?

## ■ Objectives

The research literature that this scoping review focused on addressed the education of SLPs for working with clients from a diversity of cultural backgrounds. The objectives of this scoping review were as follows:

- Map this literature in terms of the time of publication, location (the country and context in which it was created) and source of publication.
- Describe this body of research in terms of the types of research methodology employed and the aims of the included studies.
- Describe the terminology that is used in the education of SLPs to refer to the ability to work with clients from different cultural backgrounds.

## ■ Methods

### ■ Research design

A scoping review was performed based on the methodology of the Joanna Briggs Institute (Peters et al. 2020) and the PRISMA-ScR checklist (Tricco et al. 2018). The JBI approach is described as ‘the most rigorous and defined methodology’ to date (Pollock et al. 2021, p. 2105).

The scoping review methodology suited the purpose and objectives of this study because scoping reviews are often used to provide explanations of working definitions and to make clear the conceptual boundaries of a particular topic (Arksey & O’Malley 2005; Davis, Drey & Gould 2009). The iterative and inclusive nature of scoping reviews makes this a particularly useful form of evidence synthesis for higher education research, given the diversity of research designs, research methods and theoretical frameworks that appear in this field (Thomas et al. 2017).

### ■ Inclusion criteria

To be considered for inclusion in the review, information sources had to meet the following criteria:

- Were published from 2010–2021, to include only the latest information.
- Were written in English, because the researchers are proficient in English.
- Had no limitation on the source of information. Published as well as grey literature was considered for inclusion in the review. Only primary research studies were considered.
- Had to have as its focus the clinical and theoretical education of speech-language pathology students or qualified SLPs regarding working with clients from cultural backgrounds different to those of the therapist. The population, concept and context of the scoping review were as follows:

- o **Population:** Speech-language pathology students or qualified SLPs participating in continuous professional education.
- o **Concept:** Education regarding working with clients from a diversity of cultural backgrounds, or phrased differently, culture(s) different to that of the therapist.
- o **Context:** Undergraduate (UG), postgraduate (PG) or continuing professional education in the field of speech-language therapy.

## ■ Search strategy

The following seven electronic databases and the search engine Google Scholar were searched via Stellenbosch University's (SUN) Library and Information Service: CINAHL, Health Source: Nursing/Academic Edition, ERIC, Africa-Wide Information (all via EBSCOhost), as well as PubMed, Web of Science and Scopus.

The first step of the search strategy involved a limited search on the CINAHL, ERIC and PubMed databases. The medical subject headings (MeSH) that were used to index the articles that were found via PubMed in this first step of the search, and which fulfilled the inclusion criteria (based on the titles and abstracts), were analysed to develop a draft search strategy. This search strategy was discussed with and examined by an experienced health sciences librarian and thereafter refined. The search strategy was as follows:

'Speech-Language Pathology' AND (education/subheading OR 'education, professional' OR 'sensitivity training groups') AND ('culture' OR 'Cultural Competency/education' OR 'Cultural Diversity' OR 'Culturally Competent Care' OR 'Clinical Competence' OR 'psychology, social' OR 'race relations').

The following filters were activated: Abstract available, publication date from 01 January 2009 to 31 May 2021, and English language only. The final search strategies that were used on all the databases and Google Scholar are detailed in Appendix 4.

The date limits that were set during the electronic searches were 2009–2021, although only articles published from 2010 onwards were considered for inclusion; 2009 was selected as the 'bottom date' limit to ensure that all 2010 publications could be identified. In hindsight, this was not necessary and may be confusing.

To identify South African sources of information, the authors also sent emails to fourteen South African scholars in the field of speech-language therapy who are known to them as interested in and knowledgeable about the topic of the review. The email shared the review topic and objectives with these scholars and asked them to share references of any South African studies that meet the inclusion criteria of the review. The scholars included academics from each of the seven South African universities that train speech-language therapists.

## ■ Sources of evidence screening and selection

The titles and abstracts of all the sources of evidence identified through applying the search strategy to the various databases and Google Scholar were screened for possible inclusion in the full-text review phase. Each author independently searched all seven databases and Google Scholar using identical search strategies and also independently screened all the abstracts and titles. Duplicates were not removed during the title and abstract screening phase. The titles and abstracts of all the studies identified by using the search strategy in each of the seven databases and Google Scholar were screened for possible inclusion in the review. This was done to increase the reliability and validity of the title and abstract screening. The authors met each time that they had completed a search and screening on one of the databases or search engines and compared their selection decisions. Where differences between the authors' selection of studies occurred, these were discussed and a consensus decision was made on whether to include or exclude the study from the next screening and selection phase, namely, the full-text review. During this phase, the same process was followed to screen and select studies for eventual inclusion in the scoping review.

## ■ Data extraction and analysis

A charting table was developed to record relevant information from all the studies that were included in the scoping review. The charting table was first developed as a Microsoft (MS) Word document and was piloted by the two authors through independently charting the information from two articles. The authors met after this first charting exercise to compare their work and to discuss any potential changes to the table. Thereafter, the table was finalised and transformed into an MS Excel document.

The first section of the form recorded the bibliographic information of the included studies. The second section was designed to record the country and context in which the research was conducted. Thereafter, particulars about the participants included in the research or descriptive work could be entered into the table. The table also included space to record the type of study or methodology followed and the objectives of each included study. Thereafter, relevant terminology, definitions thereof and any motivations for using the terminology could be recorded in the table. The last row of the table allowed the authors to make any additional comments that could be helpful in the analysis and interpretation of the data.

Each author independently extracted information from half of the included studies and recorded it in the charting table. The two authors reviewed each other's charting and then made and discussed comments until both were satisfied that the completed charting table was accurate and sufficient for the

purpose of the scoping review. At this stage, the data analysis process could commence. Critical appraisal of the individual sources of evidence was not performed, as this is not a requirement for scoping reviews (Peters et al. 2020; Pollock et al. 2021; Tricco et al. 2018).

Basic numerical analysis was used to summarise the extent, distribution and nature of the studies included in the review. This analysis informed the findings about the number of publications on this topic per year, study locations, types of research methodologies followed by scholars in the field and the sources of publication.

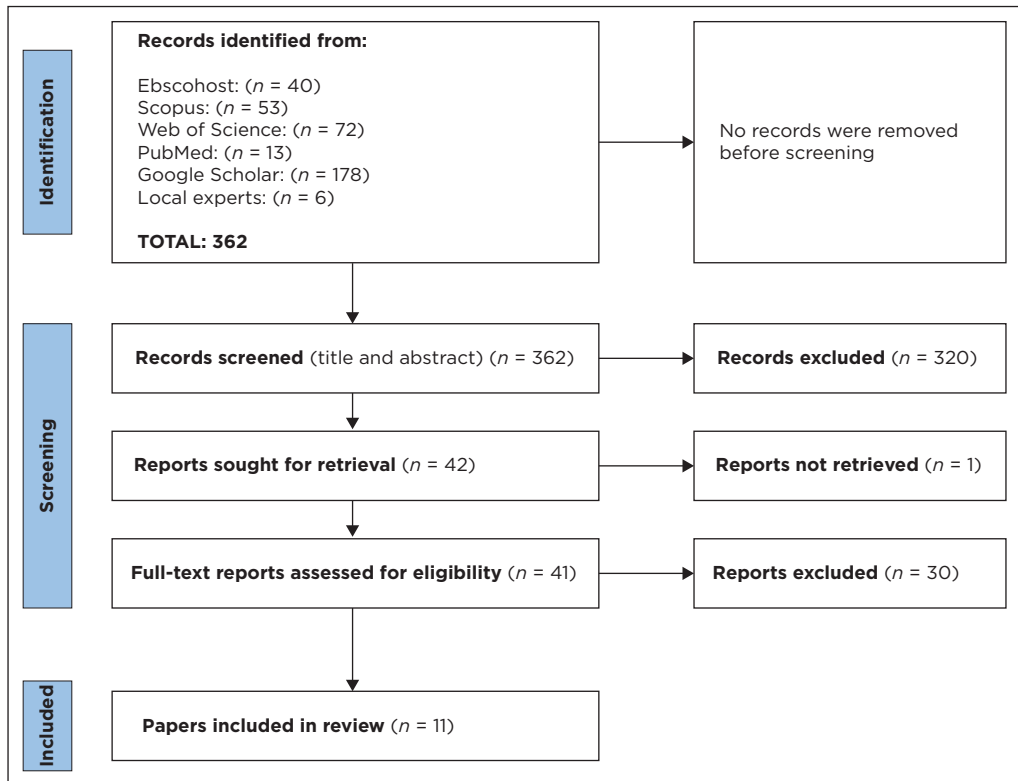
Frequency counts and thematic analysis were done to provide an overview of the aims of the studies that were included in this scoping review, as well as the terminology and definitions used by the various authors to refer to the cultural capabilities that were being taught to the speech-language pathology students or professionals.

## ■ Results

Eleven studies were included in this scoping review. The flow diagram (Figure 9.1) provides information about the number of sources of evidence identified, screened, assessed for eligibility and eventually included in the review.

All sources of evidence included in this review were identified through the electronic database and Google Scholar searches. Two of the fourteen local scholars who had been emailed about the information on research to potentially include in the review replied and identified six additional citations. However, none of these citations fulfilled the criteria for inclusion in the review. The electronic searches yielded 356 citations across the seven databases and search engines. In total, 362 titles and abstracts (including duplicates) were thus screened for possible inclusion in the review. After the title and abstract screening, 320 sources of evidence were excluded (including duplicates), and 42 full-text records were sought for retrieval. Of these, 41 could be retrieved. The full text of 41 articles was screened for inclusion in the review; of these, 11 articles were excluded at the screening stage. A further 19 sources of information were excluded at the stage of data charting as it became apparent that they did not have an educational intervention aimed at developing cultural capabilities in speech-language pathology students or professionals as their focus and thus did not address all the objectives of this scoping review. These excluded studies either exclusively examined the experiences of international or culturally and linguistically diverse students ( $n = 3$ ) (Attrill, Lincoln & McAllister 2015, 2020; Attrill et al. 2017); solely investigated students' attitudes, beliefs, knowledge and experiences regarding issues related to multiculturalism ( $n = 5$ ) (Barailo 2019; Franca et al. 2016; Howells et al. 2016; Lemmon & Jackson-Bowen 2013; Steed 2014); surveyed students' preparedness for cross-cultural intervention ( $n = 2$ ) (Caesar 2013; Privette 2015); focused on





Source: Adapted from Page et al. (2021).

**FIGURE 9.1:** Flow diagram depicting the process of the selection of sources of evidence.

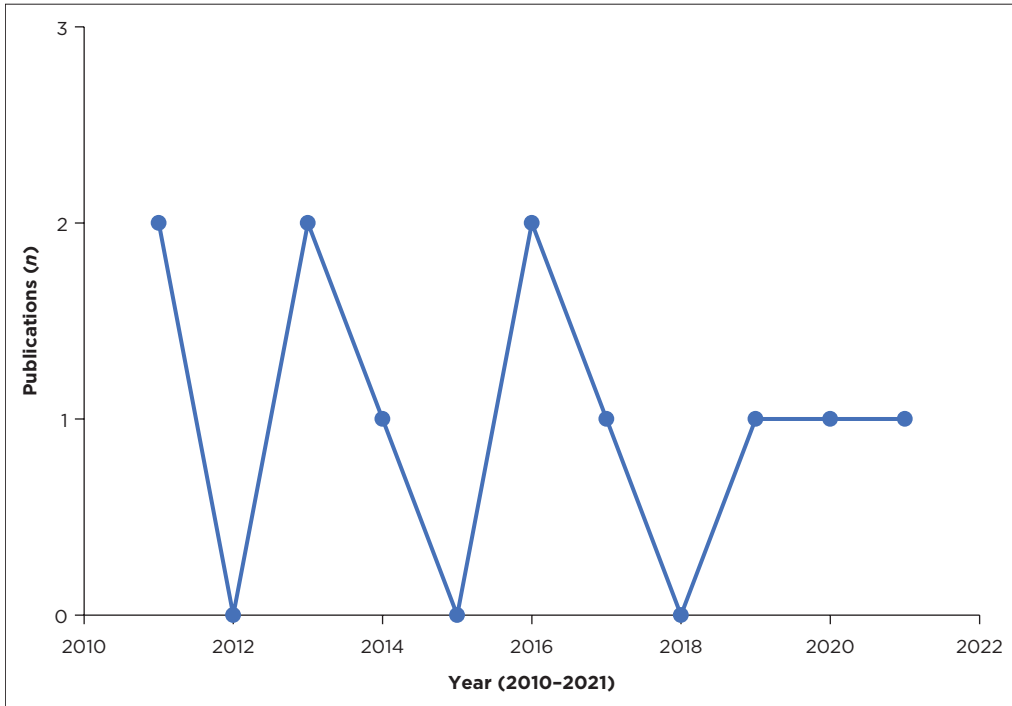
study-abroad experiences ( $n = 2$ ) (De Diego-Lázaro, Winn & Restrepo 2020; Rice 2018); were commentaries ( $n = 2$ ) (Farrugia-Bernard 2018; McDermott 2019); [it was] a review study on cultural competence in speech-language pathology in general ( $n = 1$ ) (Perry 2012); or they focused exclusively on service delivery to lesbian, gay, bisexual, transgender, queer and intersex (LGBTQI+) clients, thus representing only one aspect of culture ( $n = 3$ ) (Hancock & Haskin 2015; Jakomin et al. 2020; Matthews, Olszewski & Petereit 2020). The study that could not be retrieved was that of Dawson (2020). All the excluded studies are listed in Appendix 5.

## ■ Date, country of origin and source of the selected studies

As depicted in Figure 9.2, the frequency of publications was relatively evenly spread, ranging between no articles published on this topic (in 2012, 2015 and 2018) and two articles during each of the years 2011, 2013 and 2016.

Most of the publications originated solely from the United States of America (USA) ( $n = 9$ ). One study (Williams et al. 2013) described a collaboration





**FIGURE 9.2:** Number of publications on the education of speech-language pathologists for working with clients from a diversity of cultural backgrounds published per year from January 2010 to December 2021 ( $n = 11$ ).

between scholars from the USA and Brazil, while another study (Bernhardt et al. 2011) was conducted in Canada. No studies from the African continent could be identified, despite direct consultation with South African scholars working in the field.

Table 9.1 displays information about the sources of the publications included. All the sources of information included in the review were peer-reviewed journal articles. While some ( $n = 4$ ) articles were from journals with a multidisciplinary perspective, the majority ( $n = 7$ ) of the articles were from journals with a specific focus on the professions of speech-language therapy and audiology or speech-language therapy alone.

Five articles were published in journals endorsed by the American Speech-Language-Hearing Association (ASHA). The *American Journal of Speech-Language Pathology* and *Perspectives of ASHA Special Interest Groups* each rendered two of the included studies, while one of the reviewed articles was published in the ASHA journal *Perspectives on Communication Disorders and Sciences in Culturally and Linguistically Diverse Populations*.

All 11 articles included in the review reported on pre-professional education of speech-language pathology students in the context of university programmes.

**TABLE 9.1:** Sources of the publications that were included in the review.

Author(s) (date)	Publications focused on speech-language therapy or audiology					Journals with a multidisciplinary perspective		
	<i>American Journal of Speech-Language Pathology</i>	<i>Perspectives of the ASHA Special Interest Groups</i>	<i>Perspectives on Communication Disorders and Sciences in a CLD Population</i>	<i>Canadian Journal of Speech-Language Pathology and Audiology</i>	<i>Contemporary Issues in Communication Science and Disorders</i>	<i>Infants and Young Children</i>	<i>International Journal of Telerehabilitation</i>	<i>Journal of Cultural Diversity</i>
Bernhardt et al. (2011)				x				
Brown (2017)	x							
Brown and Woods (2011)						x		
Cassel and Edd (2016)							x	
Daughrity (2021)	x							
Franca and Harten (2016)		x						
Hernández and Hadley (2020)								x
Mahendra (2019)		x						
Matteliano and Stone (2014)								x
Preis (2013)			x					
Williams et al. (2013)					x			

Key: ASHA, American Speech-Language-Hearing Association; CLD, culturally and linguistically diverse.

Six articles pertained to graduate programmes or MA students (Brown 2017; Brown & Woods 2011; Daughrity 2021; Hernández & Hadley 2020; Matteliano & Stone 2014; Williams et al. 2013), while four were concerned with UG speech-language pathology students (Bernhardt et al. 2011; Cassel & Edd 2016; Mahendra 2019; Preis 2013). In the USA and Canada, professional training in speech-language therapy occurs at MA level. The article by Franca and Harten (2016) described pedagogical activities implemented during courses for students at a variety of levels of both research and clinical practice.

## ■ Research methodologies and aims of the selected articles

Table 9.2 reports on the aims of the included publications and the methodologies of the research studies. Only six of the included articles were research studies. Three of these articles reported on surveys, while others followed a randomised controlled crossover design ( $n = 1$ ) or a single subject-modified AB design with replication ( $n = 1$ ). One research study was explorative in nature and was described in the article as a pilot study.

The remaining publications did not report on research projects as such, but rather described courses and material for the development of students' cultural competence. Four articles presented background information and details about dedicated cultural competence courses, the development thereof and the pedagogical activities used when teaching on multiculturalism. In an effort to strengthen cultural competency education in various rehabilitation sciences graduate programmes in the USA, Matteliano and Stone (2014) reported on the development of curriculum guides on this topic.

Overall, the aims of the reviewed publications were diverse in nature. Four of the publications were described as pilot work, providing either procedural directions for future larger research investigations (Daughrity 2021), motivating for the inclusion of specific course contents, namely, LGBTQI+ content and history (Mahendra 2019), or describing the training experiences of students providing intervention to children from culturally and linguistically diverse backgrounds through telepractice (Cassel & Edd 2016). Hernández and Hadley (2020) set out to pilot a survey that could be used to measure students' perceptions of their growth related to cultural competence.

Five articles reported on outcomes in undergraduate or postgraduate students after training or exposure related to the development of cultural competence. Table 9.3 displays information about these educational interventions and the outcomes measured in the five studies.

These included assessments of students' skills, knowledge and attitudes following a variety of different types of input, ranging from performance feedback, systematic instruction, synchronous and asynchronous training

**TABLE 9.2:** Aims and research methodologies of the included publications.

Author(s) (date)	Described as pilot work	Aims			Methodologies of research studies				Non-research papers documenting the development of courses or curriculum guides and pedagogical approaches
		To report on student outcomes after training/exposure to the development of cultural competence	To report on the development of courses and educational practices	To pilot a survey to measure students' perceptions of their growth in cultural competence	Survey	Randomised controlled crossover study	Single subject- modified AB design with replication	Explorative	
Bernhardt et al. (2011)			x						x
Brown (2017)		x				x			
Brown and Woods (2011)		x					x		
Cassel and Edd (2016)	x	x			x				
Daughrity (2021)	x	x						x	
Franca and Harten (2016)			x						x
Hernández and Hadley (2020)	x			x	x				
Mahendra (2019)	x		x						x
Matteliano and Stone (2014)			x						x
Preis (2013)		x			x				
Williams et al. (2013)			x						x

**TABLE 9.3:** Educational interventions and outcomes measured in included studies.

Author (date)	Educational intervention	Assessed areas or competencies
Brown (2017)	Performance feedback	Competence in administering family-centred and culturally responsive caregiver interviews
Brown and Woods (2011)	Systematic instruction	Implementation of family-centred interview procedures guided by ethnographic principles
Cassel and Edd (2016)	Telerehabilitation experiences	Comfort levels when working with multicultural populations through telerehabilitation
Daughrity (2021)	Asynchronous, self-guided learning module	Knowledge related to cultural diversity and culturally based assessments
Preis (2013)	Synchronous training module	Racial attitudes

modules to telerehabilitation experience. Competencies that were investigated following students’ exposure to these inputs included students’ ability to administer family-centred and culturally responsive caregiver interviews (Brown 2017), students’ ability to implement family-centred interview procedures guided by ethnographic principles (Brown & Woods 2011), as well as assessments of their racial attitudes (Preis 2013) and their comfort levels when working with multicultural populations (Cassel & Edd 2016). Daughrity (2021) assessed students’ learning by means of a quiz, targeting specific knowledge (such as factors of cultural diversity) and asking questions about performing culturally based assessments. Mahendra (2019) discussed students’ perceptions after a course on LGBTQI+ culture, but this information was not collected as part of a research study.

## ■ Terminology and definitions

A variety of terminology was used in the reviewed literature to refer to cultural capabilities. These terms included cultural competence ( $n = 9$ ), cultural humility ( $n = 3$ ), cultural responsiveness ( $n = 2$ ), cultural fluency ( $n = 1$ ) and cultural safety ( $n = 1$ ), as indicated in Table 9.4. These terms were not always explicitly defined in the papers. Cultural fluency seems to have been used by Daughrity (2021) as a synonym for cultural competence.

### □ Cultural competence

Cultural competence is the term that was used in all but two studies (Brown 2017; Brown & Woods 2011). The concept was not treated as tentative or controversial in any of the selected studies but was rather acknowledged as a core element of clinical competence for all health professionals, including SLPs (Mahendra 2019). Cultural competence was often regarded as an ethical imperative for SLPs and mention was made of its inclusion in the scope of speech-language therapy practice with reference to the official documentation of ASHA (for instance, by Daughrity 2021 and Williams et al. 2013).

**TABLE 9.4:** Terminology that was used in the reviewed literature to refer to cultural capabilities.

Author(s) (year)	Cultural competence	Cultural humility	Cultural responsiveness	Cultural fluency	Cultural safety
Bernhardt et al. (2011)	x				x
Brown (2017)			x		
Brown and Woods (2011)			x		
Cassel and Edd (2016)					
Daughrity (2021)	x	x		x	
Franca and Harten (2016)	x	x			
Hernández and Hadley (2020)	x				
Mahendra (2019)	x	x			
Matteliano and Stone (2014)	x				
Preis (2013)	x				
Williams et al. (2013)	x				

The rationale for such a central position for cultural competence in the knowledge and skill set of speech-language therapists was mostly stated as the existing and growing CALD of populations across the globe and the frequent over-representation of white and often monolingual clinicians in the workforce and student cohorts. Daughrity (2021, p. 3, citing Sanchez 2008) stated that the responsibility for cultural competence does not lie with CALD populations but with ‘health care professionals to provide appropriate care to multicultural communities’.

Cultural competence was explicitly defined or described in only five of the nine articles that included the concept. Four key themes were evident in the definitions as described in the section below.

## □ Knowledge, attitudes and skills

The theme that occurred most (four times) across the various definitions was that of cultural competence encompassing knowledge, attitudes and skills.

Daughrity (2021, citing Brach & Fraserirector 2000) wrote:

[7]he meaning of cultural competency extends further than merely being aware and respectful of other cultures, languages, and backgrounds; cultural competence can be defined as respecting differences, while also being equipped to respond appropriately to properly treat diverse populations. (p. 1)

Bernhardt et al. (2011) cited a website of the British Columbia Ministry of Health that defines cultural competence as:

[...] an internalized process of adapting one’s knowledge, attitudes, behaviours, and skills to people of another culture. It alters the way people view the world around them which in turn changes the way they interact with people from other cultures. (p. 179)

Hernández and Hadley (2020) relied on the definition of ASHA (2017):

[C]ultural competence involves understanding and appropriately responding to the unique combination of cultural variables and the full range of dimensions of diversity that the professional and client/patient/family bring to interactions. (p. 3)

ASHA's definition emphasises that cultural competence does not only require knowledge, skills and attitudes with regard to the culture and language of the client and caregivers but also awareness and knowledge of the clinician's own background and how this may impact the delivery of effective care. Daughrity (2021) similarly referred to 'the proper definition assigned by ASHA' namely that:

[...] cultural competence is an intricate process that first requires an SLP to have self-awareness regarding individual cultural practices, while also being respectful of others [...] a culturally competent clinician will correctly identify difference versus disorder, continue education of other cultural practices, and provide a variety of services. (p. 2)

The last part of this definition provides an indication of the technical knowledge and skills required for culturally competent speech-language service delivery (Bernhardt et al. 2011).

## □ Lifelong development

Another theme that occurred in almost all the definitions provided is that cultural competence develops over time through a continuum of stages. Both Daughrity (2021) and Franca and Harten (2016) referred to the work of Campinha-Bacote (2002). The following excerpt is from Franca and Harten (2016, p. 92):

According to Campinha-Bacote (2002), cultural competence in the delivery of health care services should be seen as a process which involves 'becoming culturally competent' rather than 'being culturally competent'. In that sense, cultural competence is a dynamic process that involves multiple, interdependent concepts such as cultural awareness, cultural knowledge, cultural skills, cross-cultural interactions, and cultural desire (Battle 2012; Campinha-Bacote 2002; Mahendra et al. 2004).

Similarly, Daughrity (2021, p. 1) referred to Campinha-Bacote's (2002) notion of cultural competence as 'a journey of knowledge, rather than a singular achievable destination.' The idea of lifelong development of cultural ability, an aspiration rather than an achievement, correlates with definitions of the term 'cultural humility', as will be shown later.

## □ Educating for cultural competence

Three of the studies commented on the implication of the definition of cultural competence for efforts to teach such abilities.

Franca and Harten (2016) commented as follows:

The development of cultural competence is an ongoing, lifelong process. It seems intuitive that multiple approaches and techniques must be utilized to support this development, by adoption of a pluralistic methodology. (p. 90)

Matteliano and Stone (2014) did not provide a definition for cultural competence but stated that the ambiguous nature of the concept makes it difficult to define its enactment and thus to develop educational outcomes, teaching strategies and assessments. Furthermore, they acknowledged that 'it is difficult to teach students (and providers) to think reflexively, become self-aware, and be comfortable with ambiguities' (Matteliano & Stone 2014, p. 117).

### □ Understanding socio-economic factors

The final and important theme that was identified in two of the articles is the acknowledgement that 'a critical knowledge component in achieving culturally competent care' (Matteliano & Stone 2014, p. 113) is an understanding of the socio-economic factors that impact clients' daily lives. Matteliano and Stone (2014) illustrated this well:

Rehabilitation providers may also need to understand factors that complicate compliance ranging from the disruption of family support systems and social networks experienced in many poor neighborhoods, to post-traumatic disorders experienced by asylum seekers and refugees. Additionally, undocumented immigrants may withhold necessary information because they worry about deportation (Ayonrinde 2003). Socio-economic conditions, neighborhood influences, and daily stressors affect individuals' health and their ability to adapt a health-promoting lifestyle. (p. 113)

### □ Cultural humility

Cultural humility was used in three of the selected articles. Only one of these provided a brief definition of the term (Franca & Harten 2016, p. 92):

This concept of cultural competence as requiring continuous, lifelong learning, is termed cultural humility (Tervalon & Murray-Garcia 1998), which entails a permanent commitment to self-assessment, acknowledgement of limits, and continuing education that affords an authentic open-mindedness (Crowley et al. 2015; Halvorson-Bourgeois et al. 2013; Mahendra et al. 2004).

It thus seems that Franca and Harten (2016) viewed cultural humility as a particular perspective on or building block of cultural competence, although some scholars, such as Tervalon and Murray-Garcia (1998), have drawn a critical distinction between these two concepts. However, Franca and Harten's (2016) description of cultural humility is not in contrast with the descriptions of cultural competence provided in the other selected studies, that is, a continuous and long-term striving that includes self-reflection and a commitment to lifelong learning.



Similarly, Mahendra (2019, p. 390) described some educational activities to develop the attitude of cultural humility, particularly for service delivery to LGBTQI+ clients. These activities included reflection 'on what it means to have the power and privilege of being a service provider', as well as developing 'comfort in questioning own assumptions' and to 'actively learn about barriers to equal rights for LGBTQI+ clients' as well as to 'advocate for LGBTQI+ clients' and 'raise awareness about the health impact of homophobia and transphobia' (Peppard & Salisbury 1992 as cited in Mahendra 2019, p. 390). Mahendra's understanding of cultural humility thus goes further than that of Franca and Harten (2016) and includes recognition of power imbalances, human rights and unfair discrimination. This is in keeping with definitions of cultural humility in the broader literature, which includes a recognition and commitment to address the unequal balance of power that often exists in multicultural clinician-patient interactions (Yeager & Bauer-Wu 2013).

Another selected study mentioned the need to raise awareness about discrimination and privilege as part of cultural competency education. Preis (2013) wrote:

For white students in particular, issues related to racial awareness, specifically those of racism and privilege, often are not considered, as many students may be in a state of what Helms (1993) terms, *racial obliviousness*. Racial obliviousness may be due to a lack of exposure and interaction with people racially different from themselves, rendering students *colour-blind*. That is, although white students see differences, they may report that 'all people are the same', ignoring, consciously or unconsciously, the existence of discrimination and privilege. (p. 73)

## □ Cultural safety

One of the selected articles (Bernhardt et al. 2011) included the term cultural safety. It was defined as follows:

A culturally safe health care/education environment is one 'which is safe for people; where there is no assault, challenge or denial of their identity, of who they are and what they need. It is about shared respect, shared meaning, shared knowledge and experience, of learning together with dignity, and truly listening' (Williams, 1999:213). Both Johnstone and Kanitsaki (2007) and Hart-Wasekeesikaw (2009) suggest that cultural competency training (which involves development of new knowledge, skills and attitudes) is the foundation for development of culturally safe practice. Hart-Wasekeesikaw points out that the concept of cultural safety goes beyond development of new knowledge, skills and attitudes to include the acknowledgement of power imbalances between service providers and recipients. Both the agency and the individual providing service are responsible for redressing power imbalances through practices and models of service delivery that promote trust (Hart-Wasekeesikaw 2009; Ramsden 2002). (p. 179)

Cultural safety is therefore a term that refers to the experience of safety by the patient and caregiver and can be accomplished when the clinician is culturally competent and humble (Botha, Gerber & Van der Merwe 2021;

Phiri, Dietsch & Bonner 2010). It can therefore be viewed as the ultimate outcome of culturally competent health care. Cultural safety thus also requires an awareness of and commitment to redress unequal power relationships that might exist between the patient, provider and health care institution. A culturally safe health care encounter is built on mutual respect, sharing of knowledge and experience, and trust.

## □ Cultural responsiveness

Both Brown and Woods (2011) and Brown (2017) referred to the term ‘cultural responsiveness’. They did not explicitly define this term but proposed ethnographic interviewing as a method to achieve cultural responsiveness. Mahendra (2019, p. 390) similarly mentioned the use of ethnographic interviewing as a technique ‘for least biased assessment and treatment of clients with communication disorders’ along with ‘motivational interviewing, counselling, use of appropriate pronouns, etc’. Brown (2017) provided the following description of ethnographic interviewing:

Ethnographic interviewing is a recommended way to conduct culturally responsive interviews by focusing on the interviewee’s experiences and perspectives over a predetermined question script (ASHA 2017; Westby, Burdha, & Mehta 2003). General ethnographic interviewing principles include explaining the interview purpose, starting with broad descriptive questions, using more specific structural questions to explore the interviewee’s topics, following the conversational lead of the interviewee, and exploring different social contexts [...] Throughout the process, the interviewer develops insight into the interviewee’s perception of communication impairment, its effects on social functioning across contexts, and activities that are important to the individual. This insight can contribute to assessing the impact of the disability on individual functioning and to developing meaningful and functional communication outcomes (World Health Organization [WHO] 2014). (pp. 1244–1245)

It is clear how this open-ended, affirmative interview style can assist the clinician in learning about the client’s culture and how it influences the client’s experience of the disorder. In this sense, it is also a helpful tool in applying the Who’s (2014) ICT Framework. Williams et al. (2013) also cited the ICF Framework, including the version specifically focusing on children and youth (World Health Organization 2007), as useful in attaining culturally competent speech-language therapy. Ethnographic interviewing is thus a good example of a skill that can be utilised by the clinician towards the goal of cultural competence.

## ■ Discussion

This scoping review revealed that the body of literature and evidence about the education of SLPs regarding their capabilities to work with clients from various cultural groups is limited. The literature that was published on this topic was largely generated in North America, and no studies from South Africa or Africa could be found. Cultural competence was the most

frequently occurring term to refer to such capabilities in the selected studies, and the provided definitions for this term were harmonious.

Despite the relative dearth of literature, Franca and Harten (2016, p. 91) described the need for education regarding cultural competence as 'broadly recognised'. Daughrity (2021) made a similar statement:

[S]peech-language pathology, like other health care fields, acknowledges the need for cultural competence in pre-professional training programs and continuing education for clinicians to increase appropriate service delivery and client outcomes among all individuals. (p. 3)

Seven of the 11 studies included in the scoping review were from journals dedicated to speech-language therapy or speech-language therapy and audiology. Five of these seven articles were published in journals endorsed by ASHA, including the *Perspectives of ASHA Special Interest Groups*. ASHA's Special Interest Group 14 is dedicated to CALD (ASHA n.d.). This supports the statement that cultural competence, as well as education in this regard, is a recognised need within the profession.

Just as the professional and ethical requirements of ASHA include the need for cultural competence, so does the Professional Board for Speech, Language and Hearing Professions of the HPCSA (2019) demand contextually relevant services. This is only natural, given the great linguistic and cultural diversity of South Africa, as well as the persistent inequality and high levels of poverty among the populace (Khoza-Shangase & Mophosho 2018, 2021).

Cultural competence has been described in the selected studies as encompassing knowledge, attitudes and skills and as a capability that continues to develop over time. The implication is that cultural competence training should be included in all undergraduate training programmes in speech-language therapy in the country. It should also be a focus of continued professional education. It is essential that all university teaching staff – lecturers as well as clinical educators – strive for cultural competence so that they can facilitate students' learning and model the desired attitudes and skills (Cheng et al. 2001; Howells et al. 2016; Matteliano & Stone 2014). There is a need for research and information on *how to* provide this education (Daughrity 2021; Franca & Harten 2016). This need is emphasised by the very few research studies that were identified through the current scoping review, which investigated student outcomes after educational efforts to develop cultural capabilities. Most of these studies utilised descriptive or pilot methodologies. The evidence regarding the best methods for education on cultural competence in speech-language therapy is thus in its infancy. However, it seems that the education of cultural competence should include multiple approaches and techniques (Franca & Harten 2016) in order to address the knowledge, attitudes and skills necessary for cultural competence. Furthermore, what seems most sensible is an approach towards competencies

that can generalise to the specific intercultural encounters the student will face in their career, as opposed to teaching technical or prescriptive lists of what to do and what to avoid in particular encounters, for instance, when a non-isiXhosa therapist interviews an isiXhosa-speaking parent (Penn 2002, 2014). An example of such a flexible technique is ethnographic interviewing (Brown 2017; Brown & Woods 2011).

There is a lack of local research regarding the education of cultural competence. The South African context is unique in many respects. In view of South Africa's difficult history of exclusion and racial discrimination and the continuing inequality in our society, including our university classrooms and clinics (Khoza-Shangase & Mophosho 2021), it is essential to include aspects of power, privilege and discrimination, as recognised in the concept of cultural humility, in South African curricula. Vast power and socio-economic imbalances often exist between clinicians and clients, especially in the public health care sector and during cross-cultural interactions. Clinicians should be able to mitigate the potentially harmful effect of these differences on health care (Penn & Watermeyer 2018). This links to what Neff et al. (2020, p. 2) refer to as structural competence, that is, 'the capacity for health professionals to recognise and respond to health and illness as the downstream effects of broad social, political, and economic structures'. While the current scoping review provides information about the terms and definitions used in the international literature to refer to cultural capabilities in speech-language therapy, future scholarly efforts should focus on the formulation of a definition that is suitable for the distinctive local context. The end goal is culturally safe health care encounters for all South Africans.

## ■ Recommendations

Box 9.1 outlines the recommendations for practice.

### **BOX 9.1:** Recommendations for practice.

Cultural competence should be included in pre-service curricula.

Learning outcomes for knowledge, attitudes and skills should be included in cultural competence education.

Teaching and learning should take place over a prolonged period of time because cultural competence develops throughout the clinician's career.

There should be critical reflection on the international literature on cultural competence education to evaluate the adequacy and relevance for the South African context, especially given the high rate of poverty and inequality in the country.

All SLPs should develop their cultural competence, for instance, by attending courses and studying relevant literature.

Key: SLPs, speech-language pathologists.

## ■ Strengths and limitations

This is the first review of the terminology and definitions used in the speech-language therapy education literature related to working effectively with clients from diverse cultural backgrounds. The findings provide important information to South African training institutions in their quest to equip speech-language pathology students to provide contextually relevant services as required by the HPCSA (2019). The limitations of the review are that only sources of evidence available in English and available through the library service of the SUN were reviewed. Because of time constraints, the reference lists of the included studies were not searched to identify potential additional studies to include in the review. Furthermore, the date limits should have been set as 2010–2021 because only sources of evidence published from 2010 onwards were considered for inclusion in the review.

## ■ Conclusion

Literature on speech-language therapy education regarding service delivery in CALD populations is scarce. Eleven studies were included in this scoping review. The selected studies mostly originated from North America, and none were performed in Africa or South Africa. The term that was predominantly used by the authors of the included studies is ‘cultural competence’. The concept was accepted unconditionally by these scholars. The key aspects of the definitions provided were that cultural competence encompasses knowledge, attitudes and skills. It is acquired over a lifetime of practice and learning and remains an aspiration rather than a certain accomplishment. Cultural competence importantly includes an understanding of the socio-economic factors that impact clients’ lives. It will be crucial to include this aspect, as well as the factors of power imbalance and discrimination, in any future theorising and curriculum planning on cultural capabilities in South Africa. Research on how to best define and teach these competencies in the local context is recommended.

# Nurturing doers and translators: A new approach to advancing research training among undergraduate rehabilitation professions students

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## ■ Abstract

**Background:** Undergraduate (UG) education of rehabilitation professionals requires research methodology (RM) modules. Unfortunately, (1) these modules are often separated into individual programmes within the different academic divisions, prohibiting the development of a critical mass of practice-ready workforce with the potential to strengthen the health system, and (2) a rethought, broader, interdisciplinary rehabilitation research agenda is increasingly important, as ongoing developments in rehabilitation research rigour suggest changes regarding the traditional components of evidence-based rehabilitation.

**Aim:** This chapter describes the development and design of an interprofessional RM module for undergraduate rehabilitation students in the Department of Health and Rehabilitation Sciences (DHRS), Stellenbosch University (SUN) (Divisions of Physiotherapy, Occupational Therapy and Speech-Language and Hearing Therapy).

**Methods:** We describe the interprofessional development process according to the Knowledge to Action (KTA) Framework.

**Findings:** We first sought leadership buy-in, input and consensus to inform module revision. To further aid the construction of a guiding set of core competencies, we then reviewed research competencies required for rehabilitation undergraduates using a scoping review. Concurrently, we performed a document review of existing RM course content offered across the DHRS. These processes culminated in defining a set of core competencies for the module. The findings from these processes also highlighted challenges and facilitators to implementation, similarities among programme content and opportunities for shared learning experiences. We developed a revised module that is envisaged to be an enhanced offering for undergraduates (UGs) across rehabilitation sciences.

**Conclusion:** We propose the shared learning environment of an inter-divisional RM module with a focus on knowledge translation as one strategy for laying the foundation for a collaborative practice-ready workforce, especially in the context of lower-resourced countries with complex disease burdens and related disabilities.

## ■ Introduction

Research methodology (RM) training is mandatory for all South African rehabilitation programmes (Health Professions Council of South Africa [HPCSA] 2014). Undergraduate exposure to practical research competencies is associated with enhanced scholarship and improved higher-order thinking and can benefit students' understanding of local contextual needs and their roles as possible change agents for the community (Health Professional Council of South Africa [HPCSA] 2014; Knight, Van Wyk & Mahomed 2016). Unfortunately, RM training is traditionally siloed within separate academic divisions (Berman 2013), hindering collaboration and a critical mass that is crucial to the advancement of rehabilitation science. Additionally, a rethought, broader, interdisciplinary research agenda is increasingly important in rehabilitation, as evidence-based practice (EBP) has become disconnected from real life (Greenhalgh et al. 2014) (e.g. evidence from randomised controlled trials [RCTs] may be 'too pure' to address the complexity of real-life scenarios (Greenhalgh et al. 2014)). The UG RM curriculum in the Department of Health and Rehabilitation Sciences (DHRS), SUN, was revised against this background.

## ■ Driving factors to revise training

The status quo of UG RM training of rehabilitation professionals reveals several gaps and opportunities for improved and collaborative rehabilitation-specific training (Box 10.1).

All rehabilitation programmes must adhere to the minimum credit requirements for RM set by the professional regulatory bodies. Table 10.1 summarises regulatory requirements for three rehabilitation programmes:

### **BOX 10.1:** Why revise research methodology training for rehabilitation students?

*Lack of agreement on core skills and basic outcome of UG RM training, despite similarities in professional regulatory requirements.*

*A tradition of siloed UG training, despite evidence for integrated, multidisciplinary rehabilitation.*

*Undergraduate RM training provides an ideal opportunity for a co-design approach across disciplines to strengthen rigour and outcomes.*

*Strive towards enhancing quality, rigour and applicability of primary research projects and translation of evidence.*

*Advances in rehabilitation research advocate changes in the components of, and best types of evidence to inform, evidence-based rehabilitation.*

*Need to align with a global focus on achieving equity in evolving health care contexts and developing a better understanding of effective, person-centred, contextualised rehabilitation.*

Key: UG, undergraduate; RM, research methodology.



**TABLE 10.1:** Minimum standards for the undergraduate education of three South African rehabilitation professions.

Regulation regarding UG RM	HPCSA Professional Board		
	Physiotherapy	Occupational therapy	Speech-language and hearing therapy
Overall programme credits and NQF level	Minimum total credits: 480 over four years Minimum requirements for a professional degree in health sciences as per the higher education qualifications sub-framework should be complied with: NQF Exit-Level: 8 PT specifies minimum total credits at Level 8: 120.(HPCSA Professional Board for Occupational Therapy; Medical Orthotics/Prosthetics and Arts Therapy 2019; HPCSA Professional Board for Physiotherapy Podiatry and Biokinetics 2020; HPCSA Professional Board for Speech; Language and Hearing Professions 2016)		
RM credits/core content/outcome	RM (including research ethics) minimum credits: 35  'Be able to interpret and conduct supervised research in physiotherapy practice. It remains the prerogative of institutions to develop their curriculum to ensure graduates exit with the necessary knowledge, skills, attitudes and behaviours' (HPCSA Professional Board for Physiotherapy Podiatry and Biokinetics 2020, pp. 3-4).	RM minimum credits: 10% of programme credits (additional 15% can be added by training centre)  'Knowledge [supporting an] understanding of the theory of research and application of the research processes, principles and methods that promote meaningful occupational therapy research' (HPCSA Professional Board for Occupational Therapy; Medical Orthotics/ Prosthetics and Arts Therapy 2019, p. 2)	'Principles and practices of research, including experimental design, evidence-based practice, statistical methods, and application to clinical populations' (HPCSA Professional Board for Speech; Language and Hearing Professions 2016, p. 55)  'Education on the research of individuals with difficulties in speech, language, swallowing and related communication systems must include opportunities for students to acquire the knowledge, skills, and desired professional attitudes necessary to conduct basic research. Students must conduct research and write up a research report' (HPCSA Professional Board for Speech; Language and Hearing Professions 2016, p. 83).

Source: Authors' own work, compiled using information from sources indicated within the table.

Key: RM, research methodology; HPCSA, Health Professional Council of South Africa; NQF, National Qualifications Framework; PT, physiotherapy.

physiotherapy (PT), speech-language and hearing therapy (SLHT) and occupational therapy (OT) as stipulated by the HPCSA Professional Boards.

Table 10.1 illustrates slight variations in the RM training regulatory statements. Little guidance is also provided on the type of projects and research methods and – most importantly – a justifiable motivation for the core RM skills and outcomes for rehabilitation graduates. Despite consistency regarding the required inclusion of research training, there is significant scope for variations across programmes, disciplines and institutions. Variations in research outcomes of skills and attributes in rehabilitation professionals can contribute

towards division instead of cohesion to build a critical mass of rehabilitation professionals to advocate for the strengthening of rehabilitation research and services.

There is a global call for rehabilitation professionals to unite to advance rehabilitation (Gimigliano & Negrini 2017). Such actions are particularly critical for low- and middle-income countries (LMICs) where rehabilitation services are grossly underfunded, leaving many who desperately need rehabilitation behind (Louw et al. 2021; South African National Treasury 2020). In many LMICs, human resources are sparse in each rehabilitation profession, and collaborative approaches are desired to acquire political will for change (Louw et al. 2021). Undergraduate training of rehabilitation professionals traditionally remains siloed with little integration between academic disciplines (Berman 2013), despite mounting evidence for integrated, coordinated multidisciplinary rehabilitation (Ciapponi et al. 2017; Hustoft et al. 2019).

Research Methodology training offers an ideal opportunity for collaboration among rehabilitation professional programmes. Undergraduate RM training lends itself well to being a vehicle for integrated training as it is supported by similar core regulatory requirements (Table 10.1). Research Methodology is largely theoretical and therefore does not have the barrier of differences in clinical skills teaching/acquisition (Berman 2013). Competence in research methods is an important driver of scientific advancement of any health profession (Peachey, Baller & Schubert 2018). An interdisciplinary co-design approach can strengthen the rigour and outcomes of UG training (Vuurberg et al. 2019). Collaborative training can thus serve as a vehicle to standardise graduate outcomes in rehabilitation sciences and enhance transparency across programmes (Charumbira, Berner & Louw 2021). Additionally, it is imperative for students across professions to develop an understanding of the complexity of rehabilitation and how best to evaluate and control for multiple interventions. Rehabilitation lacks in the singularity of treatment, and therefore, it is difficult to ascertain if one specific intervention by any one profession brought about the desired effects. Rehabilitation is accordingly often labelled a 'black box' where multiple interventions are provided, often by multiple health professionals. Establishing a critical mass via collaborative training may improve quality in research rigour and instil core competencies for multi-professional collaboration and future practice.

Undergraduate RM students conduct research projects to implement skills; however, limited resources for primary projects are a concern. In most instances, limited/no financial support exists, and the rigour and application of the studies are limited to small samples (lacking statistical power/sampling methods and barring generalisability). Consequently, many studies are not publishable and constitute research waste. Some rehabilitation programmes considered a secondary research approach to overcome such concerns (Burger & Louw 2014). This approach was advocated as appropriate for

research 'users' instead of 'doers'. Specifically, it mirrored an evidence-based approach where RCTs are synthesised to assess intervention effectiveness. However, because of the significant increase in systematic reviews (SRs), students struggled increasingly to identify appropriate research questions/topics. Furthermore, students struggled with the interpretation of information because of limited available RCTs and had difficulty in formulating practice implications. Despite the 'marketing' of SRs as an approach towards research 'users', students lacked the required level of insight to truly understand the implications and shortcomings of studies included in the SRs.

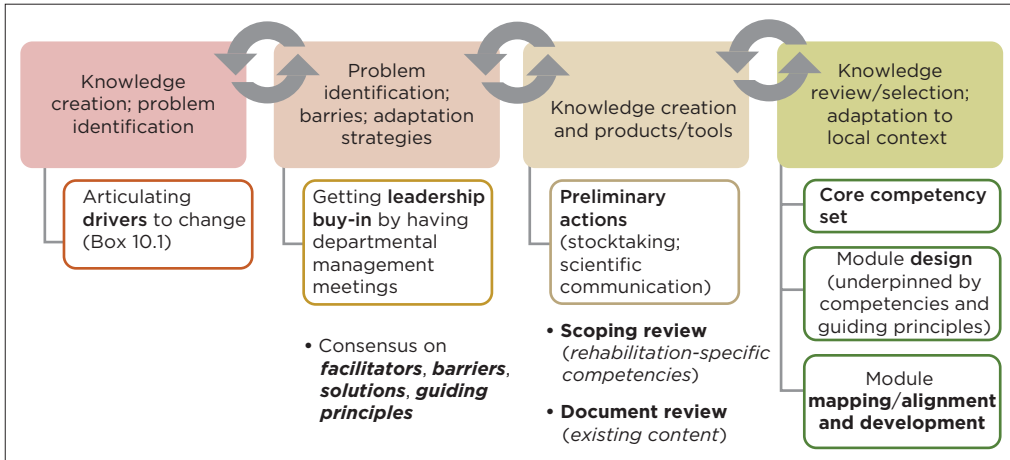
Recent advances in rehabilitation research (Cernich 2020; Dodd 2021; Negrini 2019) further emphasised the need for revision. Rehabilitation research rigour significantly improved over the past few years. Additionally, changes have been proposed regarding the components of evidence-based rehabilitation (EBR), including re-evaluation of the type of evidence that best informs clinical practice (Rosenbek 2016). Rehabilitation is a complex construct, as it comprises efforts to optimise individuals' pathways from disability to ability (Meyer & Wulff 2019). Rehabilitation can be indicated across a wide spectrum – for example, it can be appropriate for children with birth defects/disorders; for people of all ages with musculoskeletal/neurological injuries; for those recovering from surgery; and for individuals with mental health conditions (World Health Organization 2020). Rehabilitation programmes are developed for an individual. Therefore, the 'one-size-fits-all' intervention and outcome measurement approach inherent to RCTs makes them unlikely to be the most applicable design to provide evidence of rehabilitation effectiveness (Levack et al. 2019). It is unrealistic to develop a standard rehabilitation intervention or to expect to recruit a sample of participants with homogenous signs and symptoms and who are likely to respond similarly to an intervention. Rehabilitation is complicated, as it can range from being short-term (e.g. a few days for a sprained joint) to lifelong rehabilitation and maintenance care for people with irrevocably changed circumstances (e.g. brain injury). By its very nature, rehabilitation is person-centred, and to be effective, it must consider the person being rehabilitated within the context of their life, family, community and society (Meyer & Wulff 2019). Evidence for acceptable, effective rehabilitation is likely to come from sources that provide additional evidence to RCTs; thus, the current way of writing clinical practice guidelines (CPGs) (Treweek et al. 2013) is unlikely to fit comfortably with synthesising the body of evidence for rehabilitation (Negrini et al. 2020). Evidence sources that might inform rehabilitation CPGs may need to come from a range of research designs that are appropriate to answer the posed question – including qualitative and quantitative research of any design. Moreover, irrespective of the research design, it is essential that the patient-centred nature of rehabilitation is reflected in the way that primary studies are conducted and how research syntheses are developed and interpreted (Malmivaara 2018, 2019).

An increasing number of reviews are published worldwide on rehabilitation topics, reflecting a global focus on the burden of disease posed by chronic conditions and a keen interest in developing a better understanding of effective rehabilitation (Levack et al. 2019; Negrini 2019; Negrini et al. 2019). Concomitant concerns have been raised about the methodological approaches taken to produce primary and secondary evidence to inform effective rehabilitation practice, particularly the importance of incorporating patient perspectives and using outcome measures that are contextually relevant to the individual (Meyer & Wulff 2019). For instance, stroke rehabilitation guidelines based on evidence from high-income settings may need to be phrased very differently to prove effective in LMICs (Jellema et al. 2017). While patient needs may be the same (e.g. improving gait/balance), the context within which they live, their access to health care and the capacity to optimise their health gains may be impacted significantly by their sex, age, family and community roles, religion and personal agency. Strategies such as the use of the PROGRESS-Plus (Cochrane Methods Equity 2018) approach when designing primary studies on rehabilitation, and synthesising available evidence, offer a way of ensuring that rehabilitation evidence is fit-for-purpose.

While the challenges remain in terms of producing the best evidence, the opportunities to improve primary research quality and applicability, and CPG methods relevant to rehabilitation questions, will potentially change the face of RM in the next five years and guarantee that the WHO Rehabilitation 2030 Goals are met (Gimigliano & Negrini 2017; WHO 2020). It was against this background that the renewal of the UG RM curriculum in the SUN DHRS was initiated in 2018. One of the main goals was to cultivate an interprofessional graduate culture of being ‘doers and translators’ of clinical research; moving away from clinicians as passive research ‘users’. This chapter aims to describe the development of the revised offering.

## ■ Methods

Development of the interprofessional module was guided by the Knowledge to Action (KTA) Framework (Graham et al. 2006; Maree et al. 2017; Munn, Lockwood & Moola 2015). The framework consists of two components: ‘Knowledge Creation’, represented as a funnel (inquiry, synthesis, products/tools), surrounded by the ‘Action Cycle’ (problem identification; knowledge identification, selection, review; adaptation to local context; barrier assessment; choosing, adapting and implementing interventions; knowledge use monitoring; assessing outcomes; knowledge use sustainment) (Graham et al. 2006). The components comprise multiple phases that may overlap and iterate; ‘action phases may be carried out sequentially or simultaneously; knowledge phases may impact on the action phases’ (Field et al. 2014, p. 173). We detail processes related to knowledge creation and initial phases of the Action Cycle (Figure 10.1).



Source: Authors' own work, utilising terminology from the Knowledge to Action (KTA) Framework as described by Graham et al. (2006).

**FIGURE 10.1:** Knowledge to Action (KTA) Framework phases that guided the module renewal.

This chapter does not contain any studies involving human participants performed by any of the authors. However, it is part of an ongoing project approved by the SUN's Health Research Ethics Committee on 15 December 2021. The ethics approval number is N21/11/130.

## ■ Getting started: Leadership buy-in

The idea of rethinking RM training was discussed at departmental management committee meetings (2019), in which each of the rehabilitation science divisions' departmental head serves. Good practice examples of active interprofessional education (IPE) and clinical practice were already initiated at SUN and were active in selected (albeit limited) health facility training sites (Müller & Couper 2021; Müller et al. 2019; Snyman & Donald 2019). Viewed as a significant facilitator in the process, this was used as a springboard from which the idea of inter-divisional research training was introduced. The proposal included the revision rationale (driving factors), and proposition of potentially shared core attributes, skills and content blocks. Assessing potential facilitators and barriers to knowledge uptake towards implementing change, including contextually appropriate solutions, is an integral phase of the KTA Action Cycle. After debating the advantages and disadvantages of the ideas, the management team identified facilitators and barriers to the process and strategised risk mitigation actions. Additionally, a list of operational principles was compiled.

## ■ Preliminary action 1: Scoping review

A scoping review was conducted to map available evidence and identify core research competencies for rehabilitation undergraduates. The detailed

methodology is published elsewhere (Charumbira et al. 2021). Briefly, the comprehensive search aimed to identify published research (January 2009–March 2019) containing statements about research-related knowledge, skills, tasks or attitudes that rehabilitation undergraduates are taught and assessed on. Search keywords related to students in the rehabilitation professions of OT, PT and SLHT, teaching and learning, research and EBP. Data were analysed thematically.

## ■ Preliminary action 2: Document review

We aimed to: (1) map all RM content covered in 2018 within the Divisions of PT, SLHT, OT and Psychology<sup>1</sup>; (2) identify content duplicates and differences; (3) contribute towards ascertaining whether content aligns with the needs/evidence regarding undergraduate rehabilitation research competencies; and (4) contribute towards the proposition of new core content blocks. A secondary aim was to investigate the breadth and depth of coverage of study/research designs.

The next sub-section explain our process (Rohwer, Schoonees & Young 2014).

### □ Obtaining class material and module outlines and understanding lecture content and structure

We obtained available module frameworks and class materials that detailed the modules' objectives, learning outcomes, assessments and the actual content presented in class or via e-learning for 2018 (Rohwer et al. 2014). We reviewed eight RM modules (52 MS PowerPoint presentations and seven module frameworks).

### □ Extracting data

Using a custom-designed MS Excel data extraction sheet, the content was extracted according to the themes, topics and competencies preliminarily identified during the planning meetings and scoping review. These were adapted and refined iteratively throughout data extraction to include all content covered (even topics not initially identified as priority). Extracted data included division, module, year of study, module description, module aim, learning objectives, actual topics and content covered, presentation structure/duration/number of slides, instructional methods, teaching aids/materials, assignments and assessment methods. We subsequently developed a list of keywords relating to the content to aid data analysis by informing the

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1. The Psychology Division presents RM training to second-year OT and SLHT students.

identification of basic ('content keywords'), organising ('content dealt with') and global ('topics covered') themes.

One author (KB) identified all learning outcomes and content of MS PowerPoint presentations (by identifying slide headings and sub-headings in a 'table of contents' approach and screening content in the text following each heading) and performed all data extraction. Uncertainties were resolved through discussions with another author (Quinette Louw). Keywords respectively relating to content/topics were identified and coded to fit into organising and global themes for analysis.

Identification and definition of core competencies were concurrent processes to the document review. Insight was sought from the international literature via the scoping review. These evidence-informed competencies were then mapped to the content extracted from the documents. This provided insight regarding the extent to which evidence-informed competencies (considered important in the international literature) were already covered and revealed opportunities for including new content.

## □ Analysing data

Two authors (KB, Quinette Louw) consulted with the Division of Business Management, Faculty of Medicine and Health Sciences, SUN. Data were analysed according to basic (content keywords - smallest unit of analysis), organising and global themes using Power BI software. Data were presented using narrative summaries, tables and graphs.

We first extracted each programme's own lecture headings ('topics'), for example, 'Research question'. For each of these, corresponding 'content covered' was listed, which were often sub-headings/bullet points in the lecture presentations, for example, 'Research problem (definition, key characteristics, problem statement)'; and 'PICO method'. Subsequently, 'content keywords' were extracted to indicate concepts dealt with in the content (e.g. '*Research problem*'; '*Research question*'; and '*PICO*') and colour-coded to indicate the relevant division. This process was also guided by the terminology in the accompanying learning outcomes (although these were often unavailable). After extracting a full list of keywords from all divisions, we standardised and recoded these into the defined organising and global themes. Thus, although we recorded slide count for topics in our data extraction sheet, we did not use this count as an indicator of the extent of content. This was because Microsoft PowerPoint presentations were not available for all topics, and we had to analyse a mixture of module frameworks, podcasts, lecture notes and slides. For the purposes of graphically mapping the extent of content covered, we used the extracted keywords, which were indicators of the organising themes.



## ■ Defining core competencies

Triangulation of results from the leadership meetings, scoping review and document review led to the compilation of core knowledge/competencies to underpin revised content. This was presented (during meetings and via emails/podcasts) for comments and consensus among the task team, leadership and departmental staff. Valuable input was also gained from international experts (e.g. International Centre for Allied Health Evidence, University of South Australia). Development of the items was an iterative process, and items were refined throughout the process.

## ■ Designing and developing a new research methodology module

The design features of the new module, including assessments, were underpinned by the overall objectives and operational principles identified from the preliminary processes. The module design principles were discussed with content experts (SUN and University of South Australia colleagues), who were asked to create e-learning content that aligned with the storyboards presented in the provided design documents.

## ■ Findings and discussion

Findings from the above processes guided our endeavour to identify ways to innovatively enhance the teaching and learning of core rehabilitation-relevant research competencies by students and equip them with ways to overcome the disconnect between research and clinical practice.

## ■ Leadership buy-in

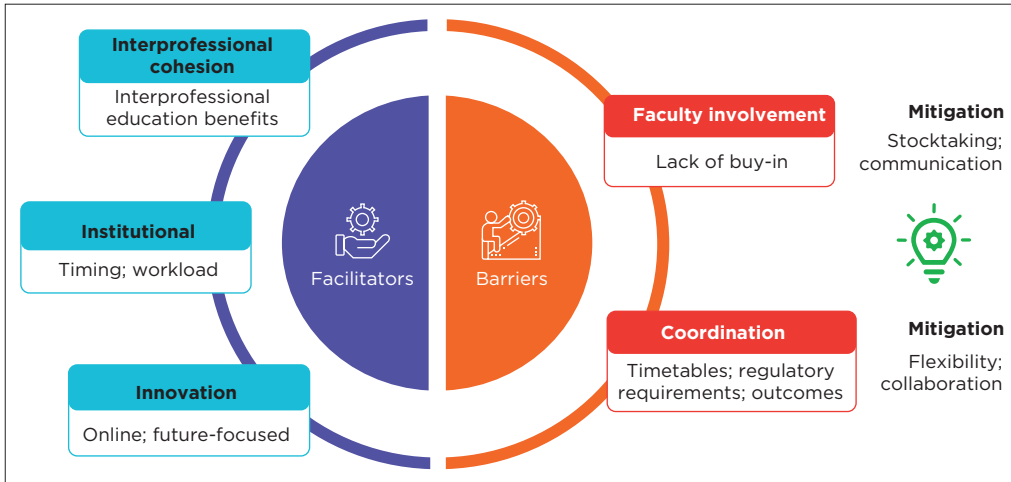
The stakeholder meetings revealed acknowledgement by all three rehabilitation divisions that a collaborative approach to the new module would play a key role in breaking down training silos. Figure 10.2 depicts the identified facilitators, barriers and mitigation strategies towards change. Based on identified facilitators/mitigations, the potential for enhanced outcomes in terms of collaborative efforts to strengthen a practice-ready workforce was recognised.

Identified *facilitators* included interprofessional cohesion, institutional factors and innovation.

## □ Interprofessional cohesion

The well-documented *benefits of IPE* could serve as a good rationale for obtaining support for the proposed IPE integrated training. All rehabilitation





**FIGURE 10.2:** Facilitators, barriers and mitigation strategies to the undergraduate research methodology renewal.

graduates must be equipped to understand the complexity of rehabilitation, including how best to evaluate and control for multiple interventions. Berman (2013) highlighted that undergraduate RM training overcomes the barrier of discipline-specific training in clinical skills. Incorporating new interprofessional modules into existing undergraduate curricula may enhance the rigour and better align the outcomes of undergraduate RM training (Vuurberg et al. 2019), promote collaborative learning and the development of an interprofessional critical mass, and improve the quality of patient care (Sulaiman et al. 2021).

## □ Institutional factors

### □ *Curriculum renewal timing*

Revision of the RM module coincided with existing plans to renew the PT and MBChB curricula as part of the SUN Strategy for Teaching and Learning 2017–2021. These developments were considered an opportune time to revisit RM training, as it could facilitate curriculum alignment. Curriculum alignment can enhance module structure (‘constructive coherence between teaching, learning and assessment’; Biggs & Tang 2011) and student learning (improve ‘awareness of their academic development and position within the curriculum’; Wijngaards-de Meij & Merx 2018, p. 219).

### □ *Workload reduction*

The prospect of *reducing workload* by reducing duplication and input in terms of time and human resources was viewed as a facilitator because of the high staff workloads in all divisions. High workload and time constraints have been

reported as barriers to undergraduate RM training among rehabilitation science academics and students (Helgøy et al. 2021; Schoonees, Rohwer & Young 2017). The likelihood of overlap in much of what is taught to undergraduate RM students and similarities in professional board regulatory requirements was deemed to hold real potential to encourage shared teaching and a spread of workload across divisions. A reduced workload would facilitate more efficient use of staff's time and could facilitate higher quality outputs. Additionally, drawing on multiple divisions to collaborate in the development of content would facilitate interprofessional cohesion and capacity-building via skill- and knowledge-sharing.

## □ Innovation

### □ *Online mode*

Innovation, including an *online blended* mode (Cleveland-Innes & Wilton 2018), was viewed as an opportunity to include innovative characteristics that contribute towards student-centeredness, enjoyment and enhanced outcomes. Such an approach not only speaks to key developments in the use of technology in higher education (Johnson et al. 2013b) but also to the SUN institutional strategic goal of moving towards educational offerings that involve more online learning, hybrid learning and collaborative models (Stellenbosch University 2019).

### □ *Future-focused approach*

The opportunity to rethink RM training for rehabilitation undergraduates within a *future-focused approach* was considered important to stay abreast with developments in EBP (particularly, evidence translation in rehabilitation). Trends include the need for a rethought interdisciplinary rehabilitation research agenda (as developments in rehabilitation research suggest changes regarding the traditional components of EBR; Cernich 2020; Ciapponi et al. 2017; Hustoft et al. 2019) and the global call for unity among rehabilitation professionals (Box 10.1). Building a collaborative practice-ready workforce, especially in the context of LMICs with complex disease burdens and related disabilities, is envisaged as the ultimate outcome.

Knowledge uptake towards implementing change can be affected by issues related to the knowledge itself, those who would be involved in adopting it and implement/support change, and the context/setting of implementation (Graham et al. 2006). As part of the KTA actions, it is crucial to identify barriers that can bar knowledge uptake so that appropriate intervention strategies can be strategised (Graham et al. 2006).

Identified *barriers/solutions* included faculty involvement and coordination.

## □ Faculty involvement

A lack of broader departmental buy-in was anticipated. The general perception was that the existing research training was viewed as adequate and meeting all requirements. Mcleod and Steinert (2015) identify clear and convincing articulation of the reasons for curricular change and ongoing renewal as a major step in curriculum renewal and overcoming resistance to change among faculty. Thus, a clear, evidence-based and convincing motivation for the change in RM training was deemed important to obtain buy-in.

*Mitigation:* Two mitigation strategies were proposed. The first was to do *stocktaking* via a document review of existing RM content across divisions (see Section 'Preliminary action no. 2: Document review'). This aligns with the first step in curriculum development, as proposed by Kern, Thomas and Howard (1998), namely, identifying and critically analysing the problem and subsequently assessing general needs (i.e. the difference between the ideal and the current approach). Secondly, the management team indicated that *communication* at all levels would be required. We accordingly made use of existing departmental communication strategies (e.g. departmental research interest meetings) as platforms to inform all colleagues about the intention. We also regularly updated colleagues via written, electronic feedback. Finally, we used scientific communication (e.g. Charumbira et al. 2021) to share interim information. The communication with staff across the department throughout the process contributed to the development of a relevant offering in the context of the DHRS.

## □ Coordination

### □ ***Differing timetables and professional board requirements***

Differing timetables and professional board requirements were considered problematic. Research training content was presented at different timeframes across divisions, and this could not only pose a challenge in designing the timetable but also lead to slow acceptance and implementation of the idea and limit the interprofessional benefits (Wijngaards-de Meij & Merx 2018). Additionally, the OT and SLHT professional boards require psychology coursework. These mandatory modules include RM content, which is presented in the second year of study – profession-specific training is then offered later in the course. These issues could impede the student experience because of a fragmented offering or repetitive content (Wijngaards-de Meij & Merx 2018).

*Mitigation: Flexibility and adaptability.* We envisaged that the online mode could allow flexibility in terms of different timeframes. We analysed the existing RM journey in all three divisions to identify corresponding time-periods. These timeslots were plotted graphically and shared with key stakeholders. The new module would (at least initially) span the final two years of the four-year UG rehabilitation curricula, as was the current case in

all divisions. The flexible, adaptable design would additionally be able to interlink with and enrich the RM content covered in the Psychology coursework. Additionally, a stepwise implementation approach was proposed, where the module would first be rolled out in one division (PT was proposed as they were already in the process of curriculum renewal) and subsequently in the other divisions. Finally, an approach that allows tailoring by divisions (selecting all or preferential module components) and students (the module will eventually include elective components) was recommended.

### □ **Unaligned outcomes**

The uncertainty regarding core research competencies for rehabilitation graduates and the cohesive outcomes of undergraduate RM training across professions were recognised. Given the siloed approach in the department, differences in current approaches (e.g. PT having adopted a secondary research approach), and in mandatory regulatory requirements, implied that RM module outcomes differed between the divisions. There would be a need to align divisional outcomes while complying with professional board regulatory requirements.

*Mitigation: Collaborative approach.* As recommended for a successful health sciences curriculum renewal process, a dynamic and representative task team (consisting of representatives from all DHRS divisions) was constituted early on, and members collectively participated in co-conceptualisation, planning and development to draw on individual and collective strengths (Mcleod & Steinert 2015). This inclusive approach was important to ensure alignment with all regulatory requirements and overarching goals.

Concurrently identified solutions to barriers, and facilitators to knowledge uptake, led to a set of pragmatic operational principles that would underpin the design of the revised RM module (Box 10.2).

**BOX 10.2:** Operational principles to guide the interprofessional research methodology module.

1. Collective decision-making.
2. Drawing on expertise across divisions for content development to share resources and time and enhance excellence.
3. Striving for an approach that will develop critical thinking/problem-solving, yet remain enjoyable for students.
4. Clarifying the linkage between clinical knowledge and research and narrowing the gap. Examples applied to rehabilitation and real-life scenarios should be incorporated (students should grasp the relevance to their clinical field).
5. Adopting a flexible and adaptable approach.
6. Setting a commencement date for pilot roll-out/implementation (2020, but because of COVID-19, it was postponed to 2021).

The shared principles would facilitate an offering tailored to the SUN setting but may also be useful in other contexts, as the risks/challenges may not be unique (Knight et al. 2016; Scaria 2004). This set of interprofessional, overarching goals that would guide the module and decision-making for all aspects relates to KTA Action Cycle phases of *problem identification* (including knowledge review - e.g. establishing shared ground rules) that would contribute towards *adapting the knowledge to the local context* (e.g. agreement on shared principles to overcome logistical barriers and establish common graduate outcomes; Maree et al. 2017).

The findings from two important Knowledge Creation actions that emerged from the 'Stocktaking and Communication' mitigation strategy are presented subsequently.

## ■ Scoping review

The scoping review found a lack of evidence providing guidance on the core research competencies specific to rehabilitation undergraduates. Competencies (Table 2 in Charumbira et al. 2021) largely resembled those reported for nursing and medical students. See Charumbira et al. (2021) for detailed results.

Briefly, we identified 45 competencies from statements related to research in 26 included studies. None overtly explored competencies best suited to rehabilitation. Competencies could be categorised into six domains: research inquiry/literature searching, research methodology/processes, dissemination, soft skills, professional ethics and attitudes. Research competencies were mostly extracted from the EBP framework (mostly the first three domains: question formulation; searching for evidence; critical evidence evaluation), which primarily contributes to undergraduates' proficiency as research *consumers*, eventuating in a poor description of (and students that lack confidence in) foundational competencies required to confidently *do* research (e.g. data collection techniques, procuring project funding, publishing, problem-solving, critical thinking). Competencies classified under soft skills, dissemination, professional attitudes and ethics were also not extensively reported. Adopting a scientist-practitioner model (clinicians well-trained in research) in the education of rehabilitation professionals has been suggested as a way to bridge the 'academic research/EBP knowledge versus real clinical practice' gap (Carter & Lubinsky 2015). Conversely, training focused on the first three domains of EBP may widen the disconnect (Peachey et al. 2018).

Further gaps regarded which research designs undergraduate rehabilitation students should be taught. Some studies advocated teaching 'most common' designs. However, apart from no studies identifying such designs, this

approach may not be appropriate in rehabilitation, considering the move towards alternative evidence sources to traditional effectiveness research (Negrini et al. 2019).

Neither the competencies nor any recommendations for improved training from the review could be endorsed as the benchmark for undergraduate rehabilitation-specific RM training because of the lack of methodological quality evaluation. Additionally, we found that some competencies that were underrepresented in the literature were nonetheless valuable for conducting/translating research. Hence, the importance of including stakeholder consultation as part of the curriculum mapping process was underscored. Nevertheless, despite not conclusively identifying 'gold standard' competencies, the preliminary set served as guidance and allowed us to address gaps in the existing DHRS curricula content and design.

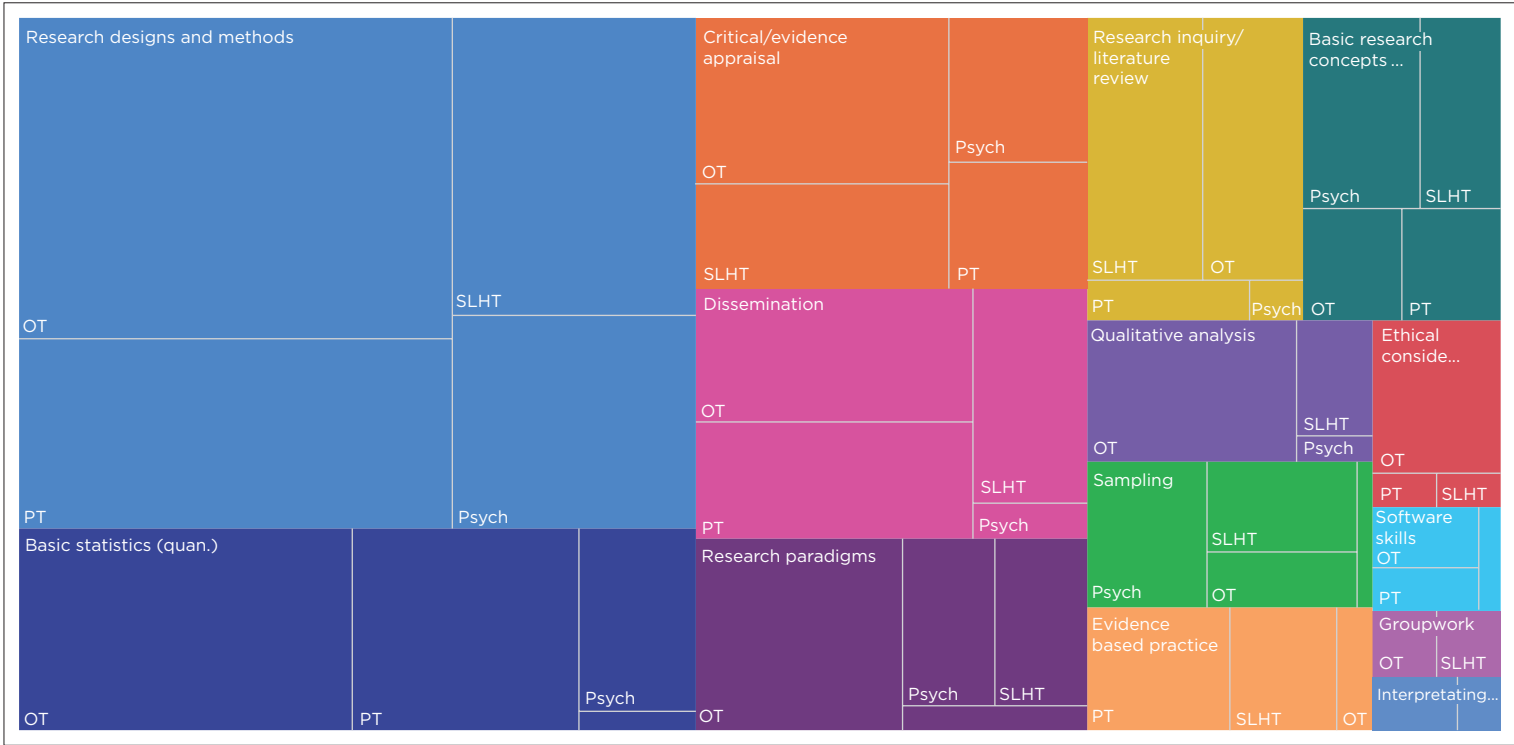
## ■ Document review

The document review revealed duplicates and gaps in RM training across divisions (Figure 10.3).

Content covered in all divisions related to basic research concepts/terminology, research inquiry, research paradigms, designs/methods, evidence appraisal, basic statistics (quantitative), dissemination and sampling. Content on EBP and professional ethics was duplicated among the DHRS divisions. All divisions except one covered qualitative data analysis, and all but one covered software skills. While all DHRS divisions made use of groupwork, only two presented groupwork-related content (e.g. specific skills). It was not evident that any divisions covered knowledge translation or critical thinking content directly (although critical thinking was covered indirectly).

Differences between divisions were also evident. Available lecture objectives indicated that each division focused on their own practice application - with no inter-divisional collaborative teamwork/integration. One division focused on secondary research and RCTs, while the others included several designs (albeit not always in detail), including extensive coverage of qualitative analysis/interpretation. One division did not include content on writing a (narrative) literature review, sample size calculation or proposal submission to a research ethics committee. Across divisions, many research designs/study types were taught, with varying amounts of detail (Table 10.2).

The main lessons from the document review were that there is much duplication in content between divisions. Although this finding was expected, it confirmed the scope to share much of the application and provided an important departure point for redesign. Topics covered across divisions broadly aligned with the domains of core competencies identified



Key: PT, physiotherapy; OT, occupational therapy; SLHT, speech-language and hearing therapy.

**FIGURE 10.3:** Topic content covered in the research methodology modules across the Divisions of Physiotherapy, Occupational Therapy, Speech-Language and Hearing Therapy, and Psychology.

**TABLE 10.2:** Research designs/methods presented in the three rehabilitation divisions.

Design/method	Division			Notes	Dedicated lecture	In larger lecture
	A	B	C			
Action research	x			Definition; phases, participatory action research; cooperative inquiry or collaborative inquiry	x	
Case control		x	x	Definition; (dis)advantages		x
Case report/series (quantitative)		x	x	Definition; (dis)advantages		x
Case study (qualitative)	x		x	As a method of enquiry/as an example of qualitative research	x	x
Content analysis	x		x	Inductive vs deductive analysis; steps/stages; narrative analysis/content analysis as an example of qualitative research		x
Contrasted group	x		x	Definition; (dis)advantages		x
Correlational	x		x	Definition/goal; characteristics; (dis)advantages (includes information handout)		x
Crossover trials/clinical trials with self-controls		x		Definition; characteristics		x
Cross-sectional	x	x	x	Definition/goal; (dis)advantages		x
Ethnographic	x		x	Definition; characteristics/example and uses	x	x
Evaluation	x		x	Definition/as an example of research question type		x
Explanatory	x		x	Mentioned		x
Exploratory	x		x	Definition/goal; (dis)advantages (includes information handout)		x
Factorial design	x		x	Characteristics; examples		
Grounded theory	x		x	Definition as one of the qualitative designs/covered as part of qualitative traditions		x
Historical			x	Definition and research question example as one of the qualitative designs		x
Life history	x			Definitions and characteristics of study types (biographical, autobiography, life history, oral history)	x	
Longitudinal/prospective/retrospective/cohort	x	x	x	Definition; characteristics; when to use		x
Methodological study	x			Examples		x
Mixed method	x		x	Describing process of scientific research for mixed methods design/uses; (dis)advantages; sequential vs concurrent design		x
Non-equivalent group	x			Definition; characteristics		x
Non-randomised controlled/clinical trial		x		Mentioned as an experimental design		x
Interrupted time-series/time-series	x		x	Definition; characteristics; (dis)advantages		x
Phenomenological	x		x	Definition; characteristics; example	x	x
Post-test only control design	x		x	Definition; characteristics; (dis)advantages		x
Pre-test/post-test control group	x		x	Definition; characteristics; (dis)advantages		x
Randomised controlled/clinical trial (two-/multigroup)	x	x	x	Definition/characteristics; (dis)advantages; when to use; and RCT design; appraisal	x	x

Table 10.2 continues on the next page→



**TABLE 10.2 (cont.):** Research designs/methods presented in the three rehabilitation divisions.

Design/method	Division			Notes	Dedicated lecture	In larger lecture
	A	B	C			
Survey	x		x	Definition/mentioned as example of descriptive research		x
Secondary designs (SR), meta-analysis, scoping review, narrative review	x	x	x	SR definition (DivA),/SR uses, contra-indications. SR and scoping review mentioned as examples of secondary designs (DivB)./Steps of literature review in scientific writing workshop (DivA&B)./Dedicated lecture on SR definition, SR vs narrative review, methods/steps, meta-analysis, forest plots. Student research projects conducted as SR/meta-analysis (DivC).	x	x

Key: Div, Division; RCT, randomised controlled trial; SR, systematic review.

Notes: Cells under the headings for divisions A, B and C with an 'x' mark that the relevant design/method was covered in the division. Cells in the two right-most columns with an 'x' mark whether the design/method was presented as a dedicated lecture or incorporated as part of a larger lecture.

from the scoping review; those classified as soft skills were variably, but mostly not extensively or at all, covered. Areas of lacking content across divisions, for example, included content specifically related to knowledge translation, specific critical thinking skills and creativity. This posed a major gap, given that both the stakeholder meetings and scoping review have highlighted competency in these topics as important. When comparing notes between what was discussed in meetings and what was documented in the class documentation, it was further evident that some competencies were addressed indirectly, but not reflecting in the module outcomes/documentated content (e.g. critical thinking and recognising gaps in the literature).

The finding that many study designs were taught, and with varying depth and breadth, corresponds with scoping review results. This posed another area for improvement, given that learning many technical terms/concepts (largely via knowledge transfer) is overwhelming and an ineffective learning strategy for undergraduates (Goldmann et al. 2018). In addition, the type of study designs covered was not necessarily the most appropriate to inform rehabilitation clinical practice (Levack et al. 2019).

Finally, as traditionally observed in higher education institutions (HEI) (Berman 2013), the document review confirmed a lack of interprofessional integration. Wijngaards-de Meij and Merx (2018) reported similar concerns specifically in the teaching of RM – where lacking communication resulted in certain content being repeated in different courses, while other aspects remained unaddressed. The current content review provided justification for shared content that would be relevant to all divisions and eliminate repetition, and for including indirectly addressed (critical thinking) or overlooked (knowledge translation) content in the revised offering.

## ■ Defining core competencies

Important rehabilitation-specific skills that emerged from the initial driving factors included EBP for individuals (considering equity factors), knowledge translation and recognition of evidence types that may best inform rehabilitation practice (Box 10.1). The stakeholder meetings further supported future-focused guiding principles (Figure 10.2; Box 10.2), including the development of critical thinking and problem-solving, and narrowing the gap between clinical knowledge and research. The large set of competencies from the scoping review could be mapped to existing module content to identify overlap and gaps. Triangulating findings from the situational analysis (stakeholder meetings, scoping review and document review) and driving factors, and consensus among stakeholders, led to the formulation of 23 core competencies for the new module, synthesised into five domains (Table 10.3).

These competencies would underpin the design of a competency-based, fit-for-purpose RM module envisaged as applicable across rehabilitation disciplines. Our finding that specific competencies are lacking for RM in the various rehabilitation professional disciplines and that the international literature also lacks specificity in this regard emphasise the need for this work beyond institutional-level cooperation and collaboration.

**TABLE 10.3:** Core competencies for the renewed undergraduate research methodology module.

Domain	Competency
<b>Core research competencies specific to rehabilitation</b>	Relevance of research to rehabilitation sciences Basic research constructs/principles: Question, sampling, believability, study design, analysis, etc. Research nomenclature and taxonomies Project planning and presentation Equity in research Research ethics
<b>Reasoning and thinking skills</b>	Problem-solving Critical thinking and reflection Creativity in research
<b>Soft skills</b>	Working in research teams/groups Decision-making in research Dealing with feedback and responding Research communication
<b>Inquiry and scientific literature</b>	Searching databases Scientific reading and information synthesis Academic and scientific writing Writing skills - argument building, strategies to synthesise content, etc. Scientific writing principles - report writing Referencing
<b>Evidence-based practice</b>	Advances in evidence-based rehabilitation Evidence-based practice for individuals (considering equity factors) Stakeholder consultation Evidence/knowledge translation

## ■ Designing and developing a new research methodology module

The design features of the new module were underpinned by the overall objectives and operational principles identified from the preliminary processes. Consequently, the design principles included the following.

### □ Methodological pluralism: Presenting an unbiased overview of research designs/approaches

Existing coursework indicated that students learnt a wide range of quantitative and qualitative study designs (Table 10.2). Teaching the structure and procedure of the designs can be time-consuming, and it remained unclear whether this approach was efficient in equipping undergraduates with research skills, and whether the timing of teaching a range of designs is appropriate at an UG level (Charumbira et al. 2021). Undergraduate students arguably do not have the capacity or time to fully understand many types of designs, especially if this involves having to memorise technical terms (Goldmann et al. 2018). More importantly, undergraduates do not have the opportunity/time to practically apply more than one approach.

As it is complex to decide which designs to teach (and preferences may differ between rehabilitation divisions), we opted for a pragmatic, methodological pluralism. This approach is advocated for UGs to learn and appreciate both quantitative and qualitative research methodologies, to develop into *pragmatic* researchers who can utilise the strengths of both techniques (Onwuegbuzie & Leech 2005a, 2005b). The shift towards teaching within a multiple methodological framework is advised as it values diverse sources of information (epistemological ecumenism rather than -purism; Onwuegbuzie & Leech 2005a). The increased use of mixed methodological approaches in rehabilitation research is further justification for this approach, as pragmatists recognise that the method(s) implemented should be driven by the research question and accordingly are able to use mixed methodologies within the same inquiry (Onwuegbuzie & Leech 2005a).

The module design team applied the principles of methodological pluralism by identifying and defining what could be regarded as 'core research pillars' (irrespective of the design). The pillars were defined as core constructs that are integral to *any* type of primary research and contribute notably to the rigour of a study (e.g. setting a research question, believability, generalisability and accurate interpretation of findings) (Onwuegbuzie & Leech 2005a, 2005b) and were designed as a series of interlinked sessions.

## □ Incorporating constructivist principles

The design was underpinned by constructivism as educational theory to encapsulate knowledge construction rather than passive intake (Grabinger & Dunlap 1995). Accordingly, the content was designed to promote understanding of research, using group work and peer evaluation, scaffolding, self-guided learning based on previous experiences, and examples to illustrate concepts rather than simply knowledge transfer (Goldmann et al. 2018). As such, the key design element for the content was focused on ‘what and why?’, instead of simply *how* to perform a series of steps in research. One example includes a session on what a research question is and why it is a necessity for any research project. The design team was constantly challenged by the ‘why?’ element as this information is not typically included in the RM texts. However, the development of this type of material was viewed as an achievement in providing a blueprint of a new and future-focused way of presenting research material to undergraduates that fosters understanding and critical thinking. The content was further designed so that each session builds on another and provides an opportunity to consolidate previously learnt constructs. In this way, students had multiple opportunities to understand, revisit and apply key research competencies.

## □ Incorporating advances in research methodology and rehabilitation research

Significant shifts and advances have transpired in rehabilitation research and methodology over the past decade. Advances in methodology towards mixed methods are increasingly evident in publications (Kroll & Morris 2009; Shaw, Connelly & Zecevic 2010; Wium & Louw 2018). Additionally, there has been much progress in the understanding of evidence in rehabilitation practice. The establishment of Cochrane Rehabilitation (The Cochrane Collaboration 2022) in 2016 anchored and steered much of the ‘new’ thinking about the more appropriate ways in which evidence for rehabilitation interventions should be generated, evaluated and applied. An illustration of shifts in evidence grading of rehabilitation interventions pertains to the evidence hierarchy. Rehabilitation professions accepted the traditional hierarchy of evidence for medicine, which places meta-analyses of RCTs as the highest level of evidence. Because of increasing recognition that this evidence hierarchy may not be the most appropriate for rehabilitation sciences, Cochrane Rehabilitation is proposing multiple evidence hierarchies (depending on the type of evidence) (Negrini 2019). In addition, there is a refreshed appreciation of the importance of the translation of research evidence to an individual person (within their unique biopsychosocial context). Because of this, an increase in the number of case studies is noted and some journals have developed unique sub-journals dedicated to case studies (e.g. *JOSPT Cases*). These types of advances were embraced in content design.

## □ **Aligning with clinical practice using easy-to-follow, fun elements**

The complexities of teaching research to undergraduates are well known (Goldmann et al. 2018; Knight et al. 2016). Students find the constructs abstract and find it hard to see how it can be applied (or is relevant) to everyday clinical practice (Charumbira et al. 2021; Peachey et al. 2018). The design team acknowledged this challenge and bridged it by aligning the content as closely as possible to clinical practice. In doing so, we aimed to provide relevance to the information for clinical practice and outcomes.

The design also adopted an approach that introduces/explains the topic along a narrative that students would find fun and engaging. In some instances, this included a fun narrative that leads students to the desired outcome. For example, the session on research question design is built on the narrative of designing *The Best Holiday Ever*, and students are prompted throughout until they have designed a question aligned with a specific population and type of holiday that would fit contextual needs. Another strategy was to teach scientific reading skills using humorous articles (e.g. Johnson, Guha & Davies 2013a's *Were James Bond's drinks shaken because of alcohol induced tremor?*) to engage students in the task.

Recently, there has been a re-evaluation of the type of evidence that best informs rehabilitation clinical practice (Rosenbek 2016). There is also a growing interest in an improved understanding of effective rehabilitation for complex patients, incorporation of patient perspectives and use of outcome measures that are contextually relevant to the individual (Box 10.1). Accordingly, the group research project that undergraduates are required to produce over the two-year module was aligned to clinical practice by introducing a case study approach, using a real patient that students encountered on their clinical rotation(s). Requiring students to conduct a case study provides an opportunity to engage in EBP in 'real-life' contexts by doing an in-depth, detailed investigation at the person level. The individual's needs and responses to an intervention, and any resultant treatment tailoring, can be analysed/interpreted/reflected upon for learning (Vance & Clegg 2012). Such a design also represents a feasible approach for clinicians to assess their treatments, as it eliminates the need for large sample recruitment (Vance & Clegg 2012). The project was designed to additionally include a rapid, systematic 'mini' evidence review (including critical appraisal) of literature relevant to one of the interventions used in the case, so that students can interpret the case profile and intervention within the context of reviewed evidence. Ultimately, the case design is envisaged to help achieve the overall module outcome of cultivating a graduate culture as 'doers and translators' of clinical research.

During module development, we considered constructive alignment theory to ensure that the outcomes, assessments and learning activities aligned

(Biggs & Tang 2011). Apart from being informed by the processes/research in our department, the module outcomes align with the graduate attributes of the SUN's Faculty of Medicine and Health Sciences and those considered 'most important' for undergraduate medical programmes (from research and professional perspectives alike) (Laidlaw et al. 2012). Core attributes for the new RM module include *curiosity*, *critical thinking*, *reflection* and *self-critique* (critical self-reflection of learning and contribution to group work), *integrity*, and *creativity and innovation*. These were mapped to the learning activities to ensure opportunities to develop and practice these attributes/competencies (Table 10.4).

The module was subsequently developed to follow an online, blended learning approach (Cleveland-Innes & Wilton 2018). Given the known complexities of teaching research to undergraduates, and considering the impacts of the digital revolution, delivering the new module using an online blended learning mode was considered an opportunity for innovation towards improved students outcomes and flexibility/adaptability (Box 10.2) (Tapscott & Williams 2010; Johnson et al. 2013b; SUN 2019). Content was created as podcasts, MS PowerPoints with interactive units, narration and other multimedia elements, interactive PDFs, quizlets, postgraduate student videos and tutorials. The module was developed for implementation via SUN's existing online learning management system (LMS) (SUNLearn). The RM training was built into various click-through topics (Figure 10.4) with multiple short 'lessons' within each topic (comprising combinations of e-learning formats) that students can access and complete asynchronously, interspersed with scheduled synchronous online debriefing sessions. The content was tested in prototype with the module development team and revised, and pilot implementation for the first cohort of students commenced in June 2021.

Our curriculum revision occurred at a single South African institution. However, our processes and observations may be useful to other institutions in Africa and elsewhere, facing similar challenges regarding undergraduate RM training in resource-constrained settings (such as adaptation to local priorities and complexities, limited time and human resources) (Knight et al. 2016; Scaria 2004). We hope our process, described according to the KTA Framework, can serve as an innovative example to show the capacity of an African institution to respond to diverse and rapidly changing local requirements for rehabilitation evidence and practice (Frambach et al. 2017).

## ■ Limitations and recommendations

We could not identify a 'gold standard' set of competencies for undergraduate rehabilitation research training, given the scarcity of published evidence.

**TABLE 10.4:** Constructive alignment of Research Methods III and IV for Rehabilitation Sciences.

Alignment	Learning outcome	Example assessment criteria	Example learning activities	Example supporting resources
<b>RM III alignment</b>	1. Understand and describe the rationale for research in all rehabilitation sciences	<ul style="list-style-type: none"> <li>Motivate the need for research in rehabilitation as a mechanism of enhancing scholarship and knowledge production</li> </ul>	<ul style="list-style-type: none"> <li>Activities to start the thinking process, for example, collaborative Word Cloud (individual and group)</li> </ul>	<ul style="list-style-type: none"> <li>Videos by DHRS researchers/postgraduates</li> </ul>
	2. Demonstrate analytical and creative thinking, reasoning and problem-solving, and apply this to rehabilitation research	<ul style="list-style-type: none"> <li>Present/articulate a structured, evidence-informed argument on a topic of interest</li> <li>Formulate a research idea and develop a scientific argument for a rehabilitation study</li> </ul>	<ul style="list-style-type: none"> <li>Critical thinking self-test (individual)</li> <li>Argumentative essay (individual)</li> <li>Self- and peer assessment of essay writing.</li> </ul>	<ul style="list-style-type: none"> <li>Guided practice</li> <li>Synchronous online debriefing</li> </ul>
	3. Understand the application of research to clinical practice and the process of EBP	<ul style="list-style-type: none"> <li>Evidence of understanding the importance of cases in clinical problem-solving</li> <li>Evidence of understanding how/ why rehabilitation professionals require research skills in daily practice</li> </ul>	<ul style="list-style-type: none"> <li>'5Ws and an H' activity to systematically analyse and creatively address a clinical case problem (group and individual)</li> <li>Case-based activity to use critical thinking and problem-solving to address person-specific context factors that may influence rehabilitation outcome (individual or group)</li> </ul>	<ul style="list-style-type: none"> <li>Podcasts, additional reading</li> </ul>
	4. Recognise and describe selected methodological principles and pillars underpinning rigorous and robust research (equity in health research, evidence contextualisation, knowledge translation, research scope, sampling, research design, ethics, believability, and basic statistical concepts)	<ul style="list-style-type: none"> <li>Formulation of a focused primary research PIO question relevant to a clinical case</li> <li>Evidence of having developed skills in primary research components</li> </ul>	<ul style="list-style-type: none"> <li>Simple 'real-life' application activities to illustrate concepts (individual and group)</li> <li>Case plan outlining how the case study will be executed (group)</li> <li>Case study: Primary data collection (individual) and draft case report (group)</li> </ul>	<ul style="list-style-type: none"> <li>Podcasts on research pillars (storyline: '<i>The perfect holiday</i>')</li> <li>Project-related podcasts (e.g. equity; case study steps)</li> <li>Synchronous debriefing</li> </ul>
	5. Retrieve scientific literature (effectively search for published rehabilitation research via common medical databases)	<ul style="list-style-type: none"> <li>Evidence of ability to define research scope using eligibility criteria and ability to construct effective search strategies for electronic databases</li> </ul>	<ul style="list-style-type: none"> <li>Argumentative essay (search literature for sources that can inform the argument) (individual)</li> <li>Draft case report (search literature for background, methods, etc.) (group)</li> </ul>	<ul style="list-style-type: none"> <li>Workshop by librarian</li> <li>Podcasts, guided practice</li> </ul>

Table 10.4 continues on the next page→

**TABLE 10.4 (cont.):** Constructive alignment of Research Methods III and IV for Rehabilitation Sciences.

Alignment	Learning outcome	Example assessment criteria	Example learning activities	Example supporting resources
<b>RM III alignment (cont.)</b>	6. Manage information overload (critical reading strategies, searches, sources)	<ul style="list-style-type: none"> <li>• Demonstrate the ability to effectively source, read, and synthesise scientific evidence</li> </ul>	<ul style="list-style-type: none"> <li>• ‘Post-it’ synthesis exercise (group/ individual) (Lundstrom et al. 2015)</li> <li>• ‘Radio interviews’ (synthesis guided activity – group)</li> </ul>	<ul style="list-style-type: none"> <li>• Guided practice/tutorials</li> </ul>
	7. Communicate research evidence effectively	<ul style="list-style-type: none"> <li>• Evidence of relevant and critical scientific reading and writing, including information synthesis, argument construction and ability to convey written information clearly, concisely, coherently, and logically – appropriately written and cited in recognised form and style (scholarly conventions observed)</li> </ul>	<ul style="list-style-type: none"> <li>• Synthesised paragraph – revise/ incorporate scientific writing principles (individual)</li> <li>• PowerPoint presentation of proposed case(s) (group)</li> <li>• Draft case report (group)</li> </ul>	<ul style="list-style-type: none"> <li>• Podcasts, guided practice/ tutorials</li> <li>• Attendance of final-year students’ research project presentations</li> <li>• Scientific writing workshop</li> <li>• Self-reflection</li> </ul>
	8. Demonstrate an understanding of the components of a research study (pillars) and apply this knowledge via planning and developing a case study project	<ul style="list-style-type: none"> <li>• Formulate a focused primary research PIO question relevant to a clinical case</li> <li>• Evidence of logical and realistic planning, conception, and execution of a research project</li> </ul>	<ul style="list-style-type: none"> <li>• Case plan (group)</li> <li>• Case study: Primary data collection (individual) and Draft Case Report (group)</li> </ul>	<ul style="list-style-type: none"> <li>• Interlinked podcasts (pillars)</li> <li>• Series of project-related podcasts</li> <li>• Forum discussions (process of PROGRESS-Plus)</li> <li>• Synchronous debriefing</li> </ul>
	9. Demonstrate project management skills	<ul style="list-style-type: none"> <li>• Evidence of demonstrated leadership of certain sections of group tasks as well as author contributions</li> </ul>	<ul style="list-style-type: none"> <li>• Case plan and draft case report (including author contributions) (group)</li> <li>• Group-led feedback sessions with supervisor (group)</li> </ul>	<ul style="list-style-type: none"> <li>• Supervisor guidance (meetings and written)</li> <li>• Suggested timelines</li> <li>• Data collection plan</li> <li>• Rubrics/instructions</li> <li>• Self-reflection and opportunity to improve aspects after first feedback</li> </ul>
	10. Collaborate with team members to enable the completion of a research project/task	<ul style="list-style-type: none"> <li>• Evidence of demonstrated teamwork</li> </ul>	<ul style="list-style-type: none"> <li>• Online group activities</li> <li>• Case plan and draft report (including author contributions) (group)</li> <li>• Case presentation (group)</li> </ul>	<ul style="list-style-type: none"> <li>• Supervisor guidance</li> <li>• Guidance/suggested group member roles</li> <li>• Group-reflection and opportunity to improve aspects after first feedback</li> </ul>

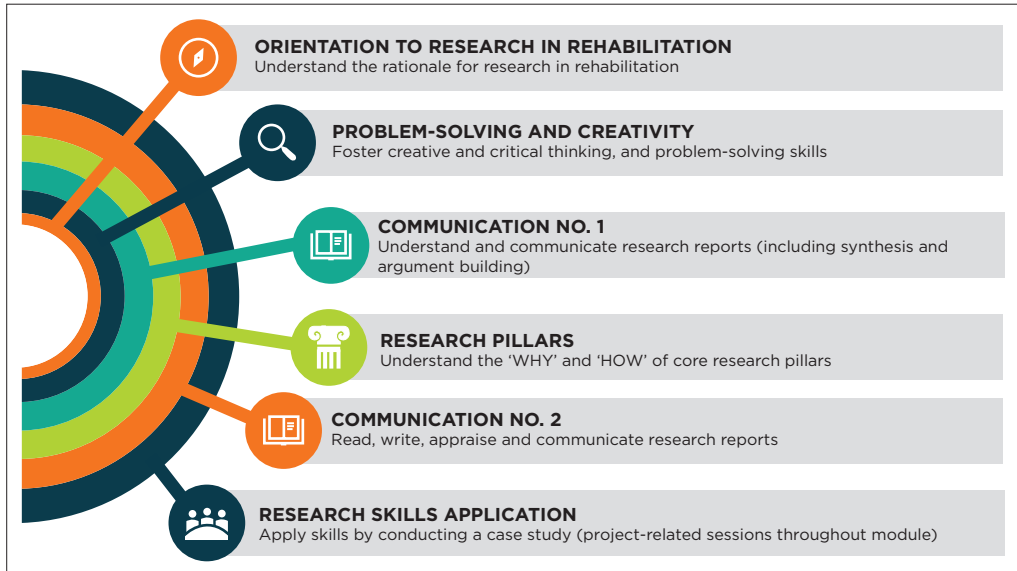
Table 10.4 continues on the next page→



**TABLE 10.4 (cont.):** Constructive alignment of Research Methods III and IV for Rehabilitation Sciences.

Alignment	Learning outcome	Example assessment criteria	Example learning activities	Example supporting resources
<b>RM IV alignment</b>	1. Develop a focused secondary research question and search strategy and retrieve relevant scientific literature using medical databases	<ul style="list-style-type: none"> <li>• Formulation of a focused secondary research PIO question relevant to a clinical case</li> <li>• Evidence of constructing a systematic search strategy for medical databases and effective retrieval of scientific literature relevant to clinical case</li> </ul>	<ul style="list-style-type: none"> <li>• Systematic searching and eligibility criteria task (group)</li> <li>• Final case report (including rapid evidence review) (group)</li> </ul>	<ul style="list-style-type: none"> <li>• Podcast/search activity</li> </ul>
	2. Recognise the rationale for, and demonstrate basic application of, pillars that underpin rigorous and robust research (basic practical data analysis (quantitative and qualitative) and reporting guidelines)	<ul style="list-style-type: none"> <li>• Evidence of having developed skills in primary and secondary research components</li> </ul>	<ul style="list-style-type: none"> <li>• Revise draft case report (group)</li> <li>• Final case report (group)</li> </ul>	<ul style="list-style-type: none"> <li>• Third-year resources</li> <li>• Podcasts, additional reading</li> </ul>
	3. Critically appraise (one) primary research design	<ul style="list-style-type: none"> <li>• Evidence of ability to critically appraise one primary research design using a reputable critical appraisal tool</li> </ul>	<ul style="list-style-type: none"> <li>• Activity to critically appraisal a primary design</li> </ul>	<ul style="list-style-type: none"> <li>• Podcasts, guided practice</li> <li>• Relevant critical appraisal tools</li> </ul>
	4. Discuss the applicability/relevance of research evidence and equity factors to a local case/clinical practice	<ul style="list-style-type: none"> <li>• Evidence of discussion of equity factors relevant to case report</li> </ul>	<ul style="list-style-type: none"> <li>• Forum discussion on PROGRESS-Plus (group)</li> <li>• Final case report (group)</li> </ul>	<ul style="list-style-type: none"> <li>• Podcasts, appropriate literature</li> <li>• Supervisor guidance</li> </ul>
	5. Collaborate with team members and demonstrate project management skills, including ethics application to ethics committee, to enable the completion of a research project/task	<ul style="list-style-type: none"> <li>• Evidence of demonstrated leadership of certain sections of group project</li> <li>• Successful ethics submission</li> </ul>	<ul style="list-style-type: none"> <li>• Reflecting on team behaviour and own role (group/individual)</li> <li>• Ethics submission; response to modifications (group)</li> <li>• Final case report, including author contribution (group)</li> <li>• Project presentations (group)</li> </ul>	<ul style="list-style-type: none"> <li>• Podcasts</li> <li>• Collaborative documents</li> <li>• Ethics committee guidelines</li> <li>• Supervisor, examiner and reviewer feedback</li> </ul>
	6. Demonstrate skills in delivering a scientific oral research presentation	<ul style="list-style-type: none"> <li>• Evidence of ability to deliver a clearly designed scientific presentation, displaying evidence of ability to communicate the main points succinctly and clearly in verbal form</li> </ul>	<ul style="list-style-type: none"> <li>• Project presentations (group)</li> </ul>	<ul style="list-style-type: none"> <li>• Podcast/tutorial</li> <li>• Rubric/instructions</li> <li>• Supervisor guidance</li> </ul>

Key: EBP, evidence-based practice; DHRS, Department of Health and Rehabilitation Sciences; PIO, Population, Intervention, Outcome; PROGRESS-Plus, place of residence, race/ethnicity, occupation, gender, religion, education, social capital, socio-economic status, plus age, disability and sexual orientation; RM, research methodology.



**FIGURE 10.4:** Topics covered in the revised two-year research methodology module.

However, in our quest towards formulating a general outline for effective curriculum mapping, we discussed the preliminary evidence with departmental/international staff at various levels for prioritisation and consensus regarding the most important competencies (Albarqouni et al. 2018; Charumbira et al. 2021). Secondly, we acknowledge that a document review of content likely does not fully reflect the true teaching and learning provided and experienced. Finally, our findings and encounters are not necessarily generalisable to other contexts, as we described here the process followed in a single university. We nevertheless endeavoured to describe the methodological practices during our research process clearly and according to a structured conceptual framework, to enhance trustworthiness of our report and conclusions. Box 10.3 summarises key recommendations for other disciplines and HEI who may wish to undertake an evaluation of current undergraduate research training offerings.

**BOX 10.3:** Recommendations for practice.

The shared learning environment of an inter-divisional RM module with a focus on knowledge translation provides one strategy for laying the foundation for a collaborative practice-ready workforce, particularly in the context of Africa and similar low-resourced settings with complex disease burdens and related disabilities.

Applying a structured approach to interprofessional revision facilitated our process and ensured consideration of local context and practices. In our case, and other South African HEI (Maree et al. 2017), the KTA conceptual framework proved useful.

Leadership buy-in, input and consensus from stakeholders across divisions should inform module revision. Such engagement is important towards identifying barriers and facilitators, and subsequent identification of operational principles that should underpin new module design. Principles identified during our process (Box 10.2) may be useful in other African contexts, as the risks/challenges identified in the current setting may not be unique to our institution (Knight et al. 2016; Scaria 2004).

Although our research process distilled 23 proposed core competencies for undergraduate rehabilitation research training (Table 10.3), there is a need for further local and international investigation into specific research competencies for undergraduate rehabilitation students beyond institutional-level cooperation and collaboration.

Key: RM, research methodology; KTA, knowledge-to-action; HEI, higher education institution.

## ■ Conclusion

This chapter described the development of a new RM module for rehabilitation undergraduates. We endeavoured to identify ways to innovatively enhance the learning of core research competencies and equip rehabilitation students with ways to bridge the gap between research and clinical practice. Therefore, innovations to enhance and merge three existing undergraduate rehabilitation RM modules, including core competencies and new application content, were developed according to the KTA framework. Changes in the face of RM training can contribute towards guaranteeing that the WHO Rehabilitation 2030 Goals are met (Gimigliano & Negrini 2017; World Health Organization 2020) (and particularly so in poorly resourced settings). Although the design and implementation of new modules, including motivation for change, are intense, time-consuming processes, using a structured approach such as the KTA framework can facilitate the endeavour and result in an evidence-informed, inclusive, contextually relevant offering (Maree et al. 2017). Cognisance of the guiding operational and design principles derived from the research conducted in our department may benefit academic staff and students by supporting flexibility and reducing resources in presentation, improving graduate experience and outcomes, and improving the quality and relevance of primary research output (although such outcomes are yet to be evaluated). The ultimate outcome of a revised offering is a critical mass of practice-ready workforce that can strengthen the health system and improve service, because of a better understanding of effective rehabilitation for complex patients, incorporation of patient perspectives and using outcome measures that are relevant to the individual within their context.

# **APPENDICES**



# Appendix 1: Interview schedule for community-based education reflection (Chapter 7)

(Questions serve as guideline – it may not be necessary to pose all questions, depending on the nature of the responses to opening questions.)

## **Welcome**

### **Opening question:**

1. How would you sum up your experience of your community rotation block at \_\_\_\_\_?
2. What aspects of your community rotation stood out for you (left an impression on you)?
3. In your opinion, what were the good aspects of the block?
  - For example, what was the highlight of the block? What were the low points?
4. Please describe any stumbling blocks you encountered?
  - Organisational, personal, curricular, contextual
  - For example, How did you find the off-campus experience? Re-accommodation, access to fellow students, library and other resources?
5. Please explain if/how you felt adequately prepared for the block?
  - Organisational, personal, curricular, contextual
6. Could you elaborate on which aspects of the curriculum were particularly helpful to you as preparation for the CBE block?
7. What suggestions would you offer to enhance and develop the block?
8. Do you think CBE (community-based training) is a worthwhile activity? Motivate your answer.
9. When you reflect on your community placement, what experience do you feel you gained there that you could not have gained in a clinic or hospital environment?
  - In what way did you feel your experience on CBE differed from other placements?
  - How did your CBE experience impact your evaluation and management of patients

10. Describe your experiences about working with other health care members and community members?

- Positive and/or negative aspects

11. Did you find the supervision adequate compared to other blocks? Please explain.

- What do you feel you need as regards supervision or other assistance on the block?

**Closing question**

12. Any other aspects that you would like to add, that you would like us to know?

(Thank you, and further steps.)

# Appendix 2: Online data collection tool (Chapter 8)

Demographic information	
Participant code	
Discipline (e.g. occupational therapy)	
Did you attend any of the following IPE activities during 2021? Mark your answer with an x in the applicable box.	Upington collaborative care ward rounds <input type="checkbox"/> Worcester collaborative care patient discussions or home visits) <input type="checkbox"/>
When were you involved in the IPE activity (which month/term during 2021)? Mark your answer with an X in the applicable box.	Month(s): Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug <input type="checkbox"/> Sep <input type="checkbox"/> Oct <input type="checkbox"/> Nov <input type="checkbox"/> Dec <input type="checkbox"/>
University year-level? Mark your answer with an X in the applicable box.	3rd year <input type="checkbox"/> 4th year <input type="checkbox"/> 5th year <input type="checkbox"/> 6th year <input type="checkbox"/>
Previous exposure to the ICF	
Did you have any prior exposure to the International Classification for Function, Disability and Health (ICF) before your involvement in the Collaborative Care Project in Worcester or Upington?	
Did you receive any theoretical teaching about the ICF during your undergraduate curriculum?	
Had you ever used the ICF as a practical framework in patient management before the IPE activities mentioned above? If so, when and in what context? What was this experience like for you?	
Exposure during the IPE activity	
How did you experience using the ICF during the IPE activity you took part in during 2021?	
What did you learn <i>with</i> other disciplines when applying the ICF during your rotation? Explain.	
What did you learn <i>about</i> other disciplines when using the ICF?	
What did you learn <i>from</i> other disciplines when using the ICF?	
How did using the ICF influence your approach to patient evaluation and management?	



<b>Since your involvement in the IPE activity</b>
In what way has your exposure to the ICF during 2021 influenced your approach to working with students from other disciplines?
Have there been other opportunities where you used the ICF framework since your experience in the IPE activity?
If so, in what situation and what was your experience?
In what way can you imagine yourself using the ICF in the workplace after you graduate?
In what way have you continued working <i>with</i> students from other professions since the IPE activity(ies)?
In what way have you continued to learn <i>from</i> students from other professions?
In what way have you <i>collaborated</i> with other professions when it comes to patient evaluation or management since the IPE activity you were exposed to?
General comments:

# Appendix 3: Matrix of analysis (Chapter 8)

Add the guiding definition and frameworks here to illustrate how it was incorporated in the framework.

		Patient management				
		Previous exposure to the ICF prior to the IPE activities	Exposure to the ICF during the IPE activities	Exposure to and use of the ICF after the IPE activities		
IPE	Learning with				Theory	Competency
	Learning about				Practice	
	Learning from				Attitude	
		Collaboration				



# Appendix 4: Search strategy (Chapter 9)

1. Search strategy used on the EBSCOhost databases, namely, Africa-Wide Information, CINAHL, Eric and Health Source: Nursing/Academic Edition:

((‘speech language pathology’) AND (education OR teaching OR training OR curriculum OR ‘sensitivity training groups’ OR ‘social psychology’ OR ‘T-Group\*’ OR ‘Encounter Group\*’ OR ‘rac\* relations’ OR ‘Interracial Relation\*’) AND (cultur\* OR Custom\* OR Belief\* OR ‘Cultural Background\*’ OR ‘cultural competency education’ OR ‘Competenc\* Cultural’ OR ‘linguistic competence’ OR ‘Cultural diversit\*’ OR Multiculturalism\* OR ‘Cultural Pluralism’ OR Pluralism\* OR ‘culturally competent care’ OR ‘Culturally Competent Health Care’ OR ‘Cross Cultural Care’ OR ‘Cross-Cultural Care’ OR ‘Cultural Care’ OR ‘Culturally Congruent Care’ OR ‘Perceptual Psychology’))

**Search field:** Abstract

**Limits set:** January 2009–2021

**‘Apply equivalent subjects’:** Selected

**Africa-wide-specific limits set:** Language – English

**CINAHL-specific limits set:** Abstract available, exclude Medline, and special interest: Speech-language pathology/Audiology, Language English

**Eric specific limits set:** Language – English

**Last searched on:** 28 April 2021

**Number of sources identified:** 40

2. Search strategy used on Scopus:

**Advanced search:**

TITLE-ABS-KEY ((‘speech language pathology’) AND (education OR teaching OR training OR curriculum OR ‘sensitivity training groups’ OR ‘social psychology’ OR ‘T-Group\*’ OR ‘Encounter Group\*’ OR ‘rac\* relations’ OR ‘Interracial Relation\*’) AND (cultur\* OR custom\* OR belief\* OR ‘Cultural Background\*’ OR ‘cultural competency education’ OR ‘Competenc\* Cultural’ OR ‘linguistic competence’ OR ‘Cultural diversit\*’ OR multiculturalism\* OR ‘Cultural Pluralism’ OR pluralism\* OR ‘culturally competent care’ OR ‘Culturally Competent Health Care’ OR ‘Cross Cultural Care’ OR ‘Cross-Cultural Care’ OR ‘Cultural Care’ OR ‘Culturally Congruent

Care' OR 'Perceptual Psychology')) AND (LIMIT-TO (SUBJAREA, 'HEAL') OR LIMIT-TO (SUBJAREA, 'SOCI') OR LIMIT-TO (SUBJAREA, 'ARTS') OR LIMIT-TO (SUBJAREA, 'PSYC') OR LIMIT-TO (SUBJAREA, 'NEUR')) AND (LIMIT-TO (PUBYEAR, 2021) OR LIMIT-TO (PUBYEAR, 2020) OR LIMIT-TO (PUBYEAR, 2019) OR LIMIT-TO (PUBYEAR, 2018) OR LIMIT-TO (PUBYEAR, 2017) OR LIMIT-TO (PUBYEAR, 2016) OR LIMIT-TO (PUBYEAR, 2015) OR LIMIT-TO (PUBYEAR, 2014) OR LIMIT-TO (PUBYEAR, 2013) OR LIMIT-TO (PUBYEAR, 2012) OR LIMIT-TO (PUBYEAR, 2011) OR LIMIT-TO (PUBYEAR, 2010) OR LIMIT-TO (PUBYEAR, 2009)) AND (LIMIT-TO (LANGUAGE, 'English'))

**Search field:** Title, abstract and keywords

**Limits set:** Date, subject areas, language

**Last searched on:** 28 April 2021

**Number of sources identified:** 53

3. Search strategy used on Web of Science (Core collection):

**Basic search:**

((('speech language pathology') AND (education OR teaching OR training OR curriculum OR 'sensitivity training groups' OR 'social psychology' OR 'T-Group\*' OR 'Encounter Group\*' OR 'rac\* relations' OR 'Interracial Relation\*')) AND (cultur\* OR Custom\* OR Belief\* OR 'Cultural Background\*' OR 'cultural competency education' OR 'Competenc\* Cultural' OR 'linguistic competence' OR 'Cultural diversit\*' OR Multiculturalism\* OR 'Cultural Pluralism' OR Pluralism\* OR 'culturally competent care' OR 'Culturally Competent Health Care' OR 'Cross Cultural Care' OR 'Cross-Cultural Care' OR 'Cultural Care' OR 'Culturally Congruent Care' OR 'Perceptual Psychology'))

**Search field:** Topic (title, abstract, author keywords, and Keywords Plus)

**Limits set:** Date range 2009-2021

**Last searched on:** 28 April 2021

**Number of sources identified:** 72

4. Search strategy used on Google Scholar:

**Advanced search:** *Find articles with all of the words:* speech language pathology AND *with at least one of the words:* education teaching training curriculum 'sensitivity training groups' 'social psychology' 'T-Group\*' 'Encounter Group\*' 'rac\* relations' 'Interracial Relation\*'

**Search field:** In the title of the article

**Limits set:** Date range, do not include citations 2009–2021

**Last searched on:** 28 April 2021

**Number of sources identified:** 151

5. Search strategy used on Google Scholar:

**Advanced search:** *Find articles with all of the words:* speech language pathology AND *with at least one of the words:* culture custom belief 'Cultural OR Background' 'cultural competency education' 'Competence OR Cultural' 'linguistic OR competence' 'Cultural diversity' Multiculturalism

**Search field:** In the title of the article

**Limits set:** Date range, do not include citations 2009–2021

**Last searched on:** 07 June 2021

**Number of sources identified:** 27

6. Search strategy used on PubMed:

**Basic search:**

'Speech-Language Pathology' [MeSH or tiab] AND (education/subheading OR 'education, professional' [MeSH or tiab] OR 'sensitivity training groups' [MESH or tiab]) AND ('culture' [MeSH or tiab] OR 'Cultural Competency/education' [MeSH or tiab] OR 'Cultural Diversity' [MeSH or tiab] OR 'Culturally Competent Care' [MeSH or tiab] OR 'Clinical Competence' [MeSH or tiab] OR 'psychology, social' [MeSH Terms or tiab] OR 'race relations' [MeSH or tiab]).

**The following filters were activated:** Abstract available, publication date from 2009 to 2021, and English language only.

**Last searched on:** 28 April 2021

**Number of sources identified:** 1



# Appendix 5: Reference list of all the studies excluded after full-text screening (Chapter 9)

- Attrill, S, Lincoln, M & McAllister, S 2015, 'International students in speech-language pathology clinical education placements: Perceptions of experience and competency development', *International Journal of Speech-Language Pathology*, vol. 17, no. 3, pp. 314-324. <https://doi.org/10.3109/17549507.2015.1016109>
- Attrill, S, Lincoln, M & McAllister, S 2017, 'Culturally and linguistically diverse students in speech-language pathology courses: A platform for culturally responsive services', *International Journal of Speech-Language Pathology*, vol. 19, no. 3, pp. 309-321. <https://doi.org/10.1080/17549507.2017.1292548>
- Attrill, S, Lincoln, M & McAllister, S 2020, 'International students in professional placements: Supervision strategies for positive learning experiences', *International Journal of Language & Communication Disorders*, vol. 55, no. 2, pp. 243-254. <https://doi.org/10.1111/1460-6984.12516>
- Barailo, A, 2019, 'Importance of cultural awareness in speech language pathology education', Honors Program Project, Bridgewater State University.
- Bird, EKR 2011, 'Health, education, language, dialect, and culture in First Nations, Inuit, and Métis communities in Canada: An overview', *Canadian Journal of Speech-Language Pathology and Audiology*, vol. 35, no. 2, pp. 110-124.
- Brown, PM & Quenin, C 2010, 'Nazareth College: Specialty preparation for speech-language pathologists to work with children who are deaf and hard of hearing', *The Volta Review*, vol. 110, no. 2, pp. 297-304.
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- De Diego-Lázaro, B 2018, 'A study abroad to Nicaragua: Measuring cultural competence in speech and language pathology students', *Perspectives of the ASHA Special Interest Groups*, vol. 3, no. 17, pp. 38-48. <https://doi.org/10.1044/persp3.SIG17.38>
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- Farrugia-Bernard, AM 2018, 'Speech-language pathologists as determiners of the human right to diversity in communication for school children in the US', *International Journal of Speech-Language Pathology*, vol. 20, no. 1, pp. 170-173. <https://doi.org/10.1080/17549507.2018.1406002>
- Franca, MC, Smith, LM, Nichols, JL & Balan, DS 2016, 'Culturally diverse attitudes and beliefs of students majoring in speech-language pathology', *CoDAS*, vol. 28, no. 5, pp. 533-545. <https://doi.org/10.1590/2317-1782/20162015245>
- Gillispie, M 2021, 'Culturally responsive language and literacy instruction with native American children', *Topics in Language Disorders*, vol. 41, no. 2, pp. 185-198. <https://doi.org/10.1097/TLD.0000000000000249>
- Hancock, A & Haskin, G 2015, 'Speech-language pathologists' knowledge and attitudes regarding lesbian, gay, bisexual, transgender, and queer (LGBTQ) populations', *American Journal of Speech-Language Pathology*, vol. 24, no. 2, pp. 206-221. [https://doi.org/10.1044/2015\\_ajslp-14-0095](https://doi.org/10.1044/2015_ajslp-14-0095)
- Howells, S, Barton, G & Westerveld, M 2016, 'Exploring the development of cultural awareness amongst post-graduate speech-language pathology students', *International Journal of Speech-Language Pathology*, vol. 18, no. 3, pp. 259-271. <https://doi.org/10.3109/17549507.2016.1154982>



Appendix 5: Reference list of all the studies excluded after full-text screening (Chapter 9)

- Jakomin, JR, Ziegler, A, Rio, C & Suddarth, R 2020, 'Opportunities to learn transgender voice and communication therapy in graduate speech-language pathology education: Preliminary E-survey findings', *Perspectives of the ASHA Special Interest Groups*, vol. 5, no. 4, pp. 876-883. [https://doi.org/10.1044/2020\\_persp-20-00047](https://doi.org/10.1044/2020_persp-20-00047)
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- McCarthy, MP, Poole, ML & Solomon, B 2010, 'Ethics: A model curriculum for teaching professional issues in university speech-language pathology and audiology programs', *Perspectives on Administration and Supervision*, vol. 20, no. 1, pp. 20-34. <https://doi.org/10.1044/aas20.1.20>
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- Privette, CM 2015, 'Self-assessment of cultural responsiveness in speech-language pathology', MA thesis, North Carolina Central University, ProQuest Dissertations Publishing, Ann Harbor, Michigan.
- Rice, AM 2018, 'i Viva Mexico! The Influence of a short-term study abroad program on speech-language pathology students' cultural competence', PhD thesis, University of Oregon, Eugene, Oregon, viewed 26 February 2023 <<http://hdl.handle.net/1794/23751>>
- Steed, R 2014, 'Caucasian allied health students' attitudes towards African Americans: Implications for instruction and research', *ABNF Journal*, vol. 25, no. 3, pp. 80-85.
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## Summary

# In summary

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The 10 chapters in this book emphasise the value of rehabilitation, through the lens of equipping future rehabilitation professionals for the dynamic rehabilitation marketplace, as informed by the Rehabilitation 2030 initiative (World Health Organization [WHO] 2017). The authors focus on the value of providing student-centred education, which can translate into graduates who provide person-centred care. While being based on empirical evidence in an African context, the book highlights cross-cutting educational principles and innovations that may inform health science education in similar contexts. The book contributes to the body of knowledge on how to strengthen and reform rehabilitation education through the implementation of evidence-informed strategies.

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When envisioning the future rehabilitation landscape, the book chapters consider the capabilities of a future-ready rehabilitation professional and cover topics such as the following:

- Person centredness and inclusiveness
- Social accountability
- The utilisation of technology in education and health care
- A renewed concept of the learning environment (learning in diverse spaces)
- A focus on collaborative learning and practice with peers, clients and fellow health care practitioners
- Evaluation of impact
- Research competencies to interpret and apply research
- Personal and professional development

The outcome of a future-ready rehabilitation graduate will benefit a multitude of stakeholders including clients, higher education institutions and health care organisations. The authors propose that the above can be achieved through purposeful curriculum development, with the envisaged rehabilitation professional in mind.

We recommend future books of this nature to build on the notions of patient education, postgraduate education, the African curriculum and the interaction with social sciences. As this book focusses on the experiences at one institution, we recommend that the next book on learning and teaching in rehabilitation sciences focus on the broader African perspective. With this book, we aimed to inform the quality of education practice by disseminating information on contextually relevant practices and reflecting on challenges experienced at a South African higher education institution.

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## Chapter 8

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This book focuses on learning and teaching in the rehabilitation sciences in an African context. Each chapter of the book focuses on the South African context and evidence-based educational practices to develop contextually and globally relevant curricula. occupational therapy, physiotherapy, and speech, language and hearing therapy divisions of the Faculty of Medicine and Health Sciences at Stellenbosch University have collaborated on the writing of this book with scholars within the Department of Health and Rehabilitation Sciences. The authors reflect on local contextual drivers for renewing rehabilitation professions curricula. The authors examine these factors in the four interrelated themes within the book, namely, 'Near-peer teaching', 'Technology-enhanced education', 'Clinical education' and 'Curriculum renewal'. Chapters in this book address curriculum-reform to develop engaging and dynamic courses, transformative learning, and learning to enable graduates to become leaders in health care management. The research and recommendations in this book pave the way for educational change toward students' professional and personal development in rehabilitation. While client-centredness remains at the heart of rehabilitation, this book showcases student-centredness at the hub of the education of rehabilitation therapists. Researchers may therefore help rehabilitation science graduates develop into competent, resilient, and reflective health care practitioners capable of adapting to changing and growing health needs.

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This cohesive book, *Transformation of learning and teaching in rehabilitation sciences: A case study from South Africa*, is well-designed to showcase the work of Stellenbosch University's rehabilitation educators and researchers. Their work represents a marvellous collaboration between occupational therapy, physiotherapy and speech-language therapy. This collaboration is notable because it focuses on interprofessional education and research during a pandemic. This book represents how a university can re-imagine rehabilitation and open the door to a deeper exploration of African ways of being and knowing.

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