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Learning for a Better Future

Perspectives on Higher Education, Cities, Business & Civil Society

Marius Venter & Suzanne Hattingh (eds.)

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Learning for a Better Future

Perspectives on Higher Education, Cities, Business & Civil Society

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Perspectives on Higher Education, Cities, Business & Civil Society

EDITORS
Marius Venter
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AOSIS

Peer review declaration

The publisher (AOSIS) endorses the South African 'National Scholarly Book Publishers Forum Best Practice for Peer Review of Scholarly Books.' The manuscript was subjected to rigorous two-step peer review prior to publication, with the identities of the reviewers not revealed to the author(s). The reviewers were independent of the publisher and/or authors in question. The reviewers commented positively on the scholarly merits of the manuscript and recommended that the manuscript be published. Where the reviewers recommended revision and/or improvements to the manuscript, the authors responded adequately to such recommendations.

Research Justification

Various international scholars and associates of the PASCAL (Place, Social Capital and Learning Regions) International Observatory (Africa hub) under the auspices of the Centre for Local Economic Development (CENLED), University of Johannesburg, have contributed chapters in this scholarly book. This scholarly book aims to demonstrate how a combination of globalisation, pandemics and the impact of innovation and technologies are driving towards a world in which traditional ideas are being challenged. The authors demonstrate a perplexing scene of ambiguity and confusion. These challenges filter down to the level of cities and smaller communities. They affect both urban and rural areas.

The book is timely because of major recent developments in each of these contexts, for example: rethinking the role of universities, their relationships with other stakeholders such as business, civil society and policy makers, rethinking the interface between urban and rural areas and building connections at various levels that facilitate and support the aspirations of individuals. The book has implications of new concepts that attempt to bridge this rapidly changing mix, such as building entrepreneurial learning cities. The book unlocks the potential of a substantial agenda for researchers at universities to support innovative attempts to find new ways to achieve just, sustainable local economic development. While this will require considerable action and innovation at the local and regional levels, it will also require building global consciousness and empathy in progressing towards a sustainable world.

This scientific work heightens the relevance in regards to the implementation of the Sustainable Development Goals (SDGs) of the United Nations (UN) to be achieved by 2030. The book carries forward a dual context and relevance: to South African social, educational, economic and cultural development, and the broader international context and action directed towards how lifelong learning for all can be fostered in communities as a foundation for a just, human-centred, sustainable world. The distinctive contribution of this book to the production of a local development body of knowledge lies in the symbiotic relationships between these objectives so that South Africa could serve as a test case in working towards approaches that have a wider international significance. The chapter contributors used the necessary research methodologies applicable in this field of specialisation to strengthen each chapter.

In conclusion, this book is action-oriented in its recommendations, which seek to empower scholars to implement or explore local development in their communities and work environments across subjects such as higher education, the SDGs, promoting lifelong learning opportunities for all, fostering cultural relations between cities, supporting the UNESCO Call to Action in building green, healthy, learning cities, promoting happiness and well-being and generally encouraging partnerships for local development.

AOSIS ensured through the editorial processes that the first 10 chapters were subjected to an authentication process to curb plagiarism and/or replication. Chapter 11 is based on the author's research and practice with regard to Age-Friendly Universities (AFU) since 2013. Documents from his work are available at eprints.gla.ac.uk. The author was responsible for developing the concept of AFU in the University of Strathclyde in partnership with Dublin City University and is part of a group of universities promoting AFU ideas and principles. Chapter 11 is mainly based on the reworking of his article 'Promoting Age-Friendly Universities which are Sustainable and Open to All: A New Challenge for the Academy?', published in the *Journal of Widening Participation and Lifelong Learning* in 2018. For the purpose of this book, the author develops the AFU theme in more depth targeting an audience different from that intended for the chapter and journal. The published article was based on a conference paper and was written for practitioners working in the field of lifelong learning. In this scholarly book, the author targets researchers working across various sectors and involved in promoting learning in cities. The goal of the reworked chapter is to interact with peers by presenting new ideas aimed at urban regeneration and city development. The two case studies, which form a substantial part of the chapter, flow from the author's research interest fields before he retired from the University of Strathclyde and the Dublin City University.

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List of Abbreviations

ACQF	African Continental Qualifications Framework
AFU	Age-Friendly Universities
AI	Artificial Intelligence
APPETD	Association of Private Providers of Education, Training and Development
CBO	Community-based Organisation
CENLED	Centre for Local Economic Development
CLL	Centre for Lifelong Learning
DCoG	Department of Cooperative Governance
DHET	Department of Higher Education and Training
GDP	Gross Domestic Product
HDI	Human Development Index
HEI	Higher Education Institutions
ICT	Information and Communications Technology
ILO	International Labour Organization
LED	Local Economic Development
LEDA	Local Economic Development Agency
NGO	Non-governmental Organisation
NPO	Non-Profit Organisation
NQF	National Qualifications Framework
OECD	Organisation for Economic Co-operation and Development

PPP	Public–Private Partnerships
PSET	Post-School Education and Training
SaaS	Software as a Service
SAQA	South African Qualifications Authority
SDG	Sustainable Development Goals
SETA	Sector Education and Training Authority
SHLC	Sustainable, Healthy and Learning Cities and Neighbourhoods
SMME	Small, Medium and Micro Enterprises
STEM	Science, Technology, Engineering and Mathematics
TUT	Tshwane University of Technology
TVET	Technical and Vocational Education and Training
UIL	UNESCO's Institute for Lifelong Learning
UN	United Nations
UNESCO	United Nations Educational, Scientific and Cultural Organization
US	United States
WEF	World Economic Forum

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Being a registered teacher opened out into a career in youth affairs, adult learning, vocational education and university professional development. Her PhD focussed on international education and as a foreign postgraduate student; she initiated the coursework and logistics of a credit abroad program to her home country. In extension, she led the expansion and quality of outreach short courses through direct and distance learning. She has voluntarily served on the executive committees of a number of professional associations and has run seminars for such community, non-government educational and training authorities.

Sustainable cities and neighbourhoods in the global era[1]

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The development patterns we see all over the world, have been bringing change worldwide. Many of these changes are technology-driven, which means they have a worldwide impact, causing 'the world to be flat', as Friedman has stated. Human development has now entered into what we may call the Global Era. We are witnessing the consequences every day. There are positive and negative elements in the evolution. Many people experience that this evolution is occurring at a fast rate and is proving to be complex and confusing to many. The globalisation based on technology-driven development and even some black swan-events also created worrisome effects such as the wars in the Middle-East, the migration waves we see all over the world and failure of the political classes. There are new paradigms to be reckoned with.

As Konvitz observed at the acceptance of the Pretoria statement by the PASCAL International Observatory (Africa): 'we should think about and act upon the promising new innovations

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1. The author of this Foreword was invited to participate as a 'guest author' with PASCAL/CENLED, for the project on 'Learning for a better future: Perspectives on higher education,cities, business & civil society'.

of our age. These should lead to sustained initiatives which call for good governance and partnerships'. These are not necessarily new things; in Africa, for example, the change will be massive, and this is driven by features and trends that are already embedded in the ongoing development of the continent.

There is already the rise of the metropolis, the urbanisation of larger parts of society, which calls for multiple answers to a number of questions: What is going to happen to the nation-state? What is the new relationship between urban and rural areas? How will communities, their individual constituents and the communities as a whole act and react? What will be needed in terms of methodology, technology and philosophy to support communities and their members to realise true empowerment. What is the role of business going to be in the future?

The narrative is indeed changing rapidly, and indeed, this is happening on the basis of elements that are already embedded in our societal fabric. The change is happening, and there are a number of examples in the chapters in this book addressing these issues.

Education and the university sector particularly, as a knowledge institution, have to play a major role in this development. We need deep-learning strategies and relevant curricula. Education in general, and the university in particular, needs to define new research and development questions, and develop deep-learning strategies for transformative learning. Among issues to be addressed is the need to rethink the concept of the learning cities and regions, and ensure that these are sustainable. In Chapter 2, Osborne et al. explore urbanisation and define the complex interrelationships that exist between education, health and well-being in the growth of the sustainable city.

Overall, radical changes in the situation of cities and rural areas in this global era of interconnected communities and people, challenge our capability to respond to a new era in creative ways. While offering opportunities for innovative approaches, cities and rural areas stand at the frontier in this transition to a new chapter in the human story.

Globalisation: Impacts and responses[2]

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The varied impacts of globalisation are combining with the effects of rampant urbanisation and new technologies to make the transition to a new era in human history. While globalisation has brought many benefits, it has associated affluence with growing inequality between and within countries. This is a non-sustainable world. The downside of globalisation includes the impact on groups disadvantaged by the effects of globalisation. These include people who have lost jobs in areas such as manufacturing, where the outcomes have been significant, while there are cases where the effects have been even more dire.

Local economic development has been one practical means of ameliorating the impact of globalisation on communities by strengthening local businesses with the retention of populations through viable opportunities.

Globalisation impacts on the operation of markets in ways that are complex and not easily understood. Prof. Peter Baur provides an example of the penetration of global institutionalised

2. The author of this Foreword was invited to participate as a 'guest author' with PASCAL/CENLED, for the project on 'Learning for a better future: Perspectives on higher education, cities, business & civil society'.

behaviour in relation to the 'Fine Art' market and applies a methodology to assess risks associated with investment and how sensitive aspects of culture are to international events. Baur explores how behavioural economists look at the ways we interpret, understand and attribute meaning to justify prices and value, and applies this to the international art market.

Rethinking the role of higher education

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The role of higher education and other occupation-directed education and training in cooperating with communities, cities/ regions and industry plays a meaningful leadership role in progressing from the current era of turbulence to a sustainable future. As the pace and complexity of global society increase exponentially, there is an urgent need to realign education and training with the needs of people that the educational systems are intended to serve. While universities have long been vital and powerful drivers of global innovation and economic development, they must contribute towards achieving meaningful progress for advancing societal and economic well-being.

It is imperative that higher education institutions and other education and training providers in the Post-School Education and Training (PSET) sector are deeply socially embedded, thereby fostering development through direct engagement. These institutions must work creatively and be willing to take risks to increase their relevance in a global era in which the world of work is rapidly and significantly altered because of the disruptive technologies of the Fourth Industrial Revolution. Rethinking higher education has become particularly relevant as institutions have needed to adapt quickly to working virtually

during the COVID-19 lockdown, and will need to continue to adapt in the post-COVID-19 teaching and learning environment. Higher education institutions and others involved in preparing the current and future workforce for participating productively in the world of work have a critical role to play in contributing towards the creation of sustainable societies amidst the complex challenges of the digital global age.

Learning for a better future: Perspectives on higher education, cities, business and civil society

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■ Introduction and overview

The origins of this scholarly book lie in a report published by the Organisation for Economic Co-operation and Development (OECD) in 2016 titled: 'Trends Shaping Education 2016'. This report provides an overview of key economic, social and demographic trends and raises questions about their potential impact on the sectors of education and society generally. The report shows how a combination of globalisation and the impact of technologies are driving towards a world where many traditional ideas, including the role and objectives of education, are being challenged. It shows a perplexing scene of ambiguity and confusion.

The OECD (2016) observed:

> The challenges confronting global decision makers are now more complex, intertwined, and growing in intensity and urgency. (p. 15)

These challenges filter down to the level of cities and smaller communities. They affect both urban and rural areas, and impact on the traditional roles and objectives of universities, schools and colleges, providing leaders in these institutions with complex challenges in preparing students for life and work in a turbulent world where there are few certainties.

It is a world of transition that poses a stark question for higher education: what is the role of universities and colleges in a transitional world at a time of accelerated change? The book addresses this question along with the related question of how lifelong learning for all can be fostered in communities as a foundation for a just, human-centred, sustainable world.

Higher education, along with a range of partners, has a key role in responding to this confusing context, in teaching and research and engaging with communities at all levels in alliances that search for a good, sustainable future. Dialogue and ongoing learning by all stakeholders are the necessary foundation in this search for a good sustainable future.

The PASCAL (Place, Social Capital and Learning Regions) International Observatory (Africa hub), under the auspices of the Centre for Local Economic Development (CENLED) discussed these challenges posed by the OECD with ideas and experiences presented by various international scholars at a PASCAL International Conference in Pretoria in October 2017 and ongoing symposiums. These events have given shape and coherence to the book as a basis for an ongoing dialogue, both in South Africa and internationally.

This scholarly book heightens the relevance in regards to the implementation of the United Nations Sustainable Development Goals (UN's SDGs) to be achieved by 2030, and carries forward a dual context and relevance: to South African social, educational, economic and cultural development, and the broader international context and action directed at a just, sustainable future globally. The distinctive value of this book lies in the symbiotic relationships between these objectives so that South Africa could serve as a

test case in working towards approaches that have a wider international significance.

The book is timely because of major recent developments in each of these contexts. Redefining the growth narrative means rethinking the roles of universities, their relationships with other stakeholders such as business, civil society and policy makers, rethinking the interface between urban and rural areas and building connections at all levels that facilitate and support the aspirations of individuals. The implications of new concepts that attempt to bridge this rapidly changing mix, such as building entrepreneurial learning cities, need to be assessed. There is a substantial research agenda for universities to support innovative attempts to find new ways to achieve just, sustainable local economic development (LED). While this will require considerable action and innovation at the local and regional levels, it will also require building global consciousness and empathy in progressing towards a sustainable world as articulated in *Transforming Our World: the UN 2030 Agenda* (2015).

In conclusion, the action orientation of the book has been given focus in the Pretoria Statement adopted by the PASCAL International Observatory. The items in the statement range across subjects such as the key role of universities and their graduates in action contributing to the UN's SDGs, the important need to promote lifelong learning opportunities for all, fostering cultural relations between cities, supporting the United Nations Educational, Scientific and Cultural Organization (UNESCO) Call to Action in building green and healthy learning cities, promoting happiness and well-being and generally encouraging partnerships.

The book is divided into three parts covering 11 chapters.

■ Overview of the three parts

Part 1 of the book focusses on the need for issues relating to global sustainability and strategies for progressing towards learning cities

and neighbourhoods. Part 2 discusses the international imperatives for human-centred, sustainable development in rural contexts to explore two institutional mechanisms that can be used to promote developmental objectives at the community level. Secondly, it explores globalisation at the forefront of the restrictive institutionalisation of innovation, with specific reference to the 'Fine Art' market. Part 3 on rethinking the role of universities gives a necessary coherence to the book, linking developments in local communities and the international arena.

The chapters in Part 3 follow on the ideas from Parts 1 and 2 and focus on the imperative for universities to realise the vital role they have in fostering partnerships between business, government, civil society and universities in responding to this turbulent era in human history in an integrated way. This is positioned in the context of fast-changing technology and how people at all levels in society seek to understand changes in society, as well as how universities can assist them to understand and learn how to adapt, integrate and contribute to positive change. The challenge of universities goes beyond this to foster wisdom and human values in this era of sustainable development.

The chapters are as follows.

■ Chapter 1: Progressing towards a good, human-centred, sustainable society – Peter Kearns

This chapter addresses the challenge of progressing from the turbulence of a confusing world in transition, towards a good human-centred sustainable world. The centrality of achieving lifelong learning objectives for all as a step towards a more equitable world is emphasised, along with the related challenge of building a mindful learning culture in communities that empowers people and equips them to respond to the challenges of a different era in human history as it unfolds. These questions are discussed in a number of contexts, including the question of progressing towards and perhaps achieving the UN's SDGs.

■ Chapter 2: Sustainable, healthy learning cities and neighbourhoods – Sohail Ahmed, Gideon Baffoe, Ramjee Bhandri, Graeme Young and Michael Osborne

Urbanisation can help drive sustainable development. However, within cities, poverty and inequalities are at their most acute, and in lower- and middle-income countries, rapid growth because of rural–urban migration poses challenges of global proportions. Global urban policies for developing countries tend to operate at a very general level; research and understanding of urbanisation are fragmented and mainly focused on the conditions and life in slum areas. We know very little about the social, economic and physical structures of fast-growing cities in developing countries and how they are changing, especially at the neighbourhood level. Apart from slums, there are many different types of urban neighbourhoods emerging in fast-growing cities.

One approach to the dualities of urbanisation recognises the complex interrelationships between sustainable cities, education and health, at the level of the urban neighbourhood. Sustainable cities depend on populations with the resilience and resources that health brings, and on relevant learning. This chapter explores this in the context of emerging work in the United Kingdom, China, India, Bangladesh, the Philippines, Tanzania, Rwanda and South Africa.

■ Chapter 3: The role of local economic development agencies and non-profit organisations in local economic development: South African case studies – Simon Taylor, Sinethemba Mthimkhulu and Sinakhokonke Mpanza

The functionality of economic development has been viewed under the Puljiz mechanism of catalytic local management. More particularly, theoretical frameworks of cooperative co-management

and co-production by stakeholders are tested against practices in other countries around the world for South African relevance. In looking at ways to strengthen domestic economies, this chapter analyses Local Economic Development Agencies and Non-Profit Organisations as institutional mechanisms to mobilise and stimulate local development, with reference to two case studies: Umhlosinga Development Agency and the Siyavuna Development Centre in rural KwaZulu-Natal.

◼ Chapter 4: Global institutional behaviour in the market for 'Fine Art': Exploring art and innovation at the core of globalisation – Peter Baur

This chapter explores issues involved in innovation against the background of Schumpeter's assertion that one of the greatest tragedies of the entrepreneurial spirit is how innovation is often institutionalised. But, how does this relate to inefficient markets or information in a world of evolving universal reality? Baur explains the manipulation between the private (art institutions) and public (art investors) sectors because of an asymmetrical distribution of information, with globalisation at the forefront of the restrictive institutionalisation of innovation.

Aspects of meaning, determining individual choice, cyclic relationships and uncertainty, as well as demand, all impact the utility curve of the market for 'Fine Art'. By using Tobin's Q theory of real investment with the capital asset pricing model, the art price index reflects how institutions regulate public information as an indication of risk or stability in the global market of art, antiquities and collectables. Often, this level of risk is mitigated through market stability, and the more efficient a market appears, the greater the level of market stability. For the art market to be efficient, it should meet the same standards that would be applied to other financial markets. This would mean that the prices in the art market should be an unbiased representation of all other currently available information within that market.

■ Chapter 5: Pivoting higher education and training towards agility and flexibility to manage critical change – Shirley Lloyd

This chapter highlights three critical issues that are disruptors to higher education, and which underpin the necessity for higher education to pivot towards agility and flexibility, in order to survive and grow in the face of major changes. These three critical issues are the impact of the Fourth – and even Fifth – Industrial Revolutions; the changing world of work and jobs, and the impact of the global coronavirus disease 2019 (COVID-19) pandemic. The chapter presents the view that it is not the fittest that will survive so much change in such a short period of time. Rather those systems and organisations that are agile, flexible, adaptable and are able to align will create a new environment in which they navigate the changes sustainably.

■ Chapter 6: Shifting economies and the need for new skills – Elana Swanepoel

This chapter contextualises the concept of the Fourth Industrial Revolution to enable the identification of the different types of skills that would be needed in the future. Owing to the continuous disruptive nature of new technologies, not only would the availability of the required skills be obligatory, but also the continuous adaptation of existing skills and the development of new skills.

The chapter identifies the range of skills that would be required for employees working in industries that have adopted the disruptive technology of the Fourth Industrial Revolution. First, the concept of the Fourth Industrial Revolution is defined and its opportunities and challenges highlighted. This is followed by a discussion of relevant skills demanded by the Fourth Industrial Revolution, especially technical, work readiness, soft/human and entrepreneurial skills. Thereafter, some implications of the Fourth Industrial Revolution for production processes, business, government, education and the individual are described. The World Economic Forum Strategic Intelligence model of the Fourth Industrial Revolution is explored.

In conclusion, the chapter explains that to comply with the skills demands of the Fourth Industrial Revolution, an integrated approach to skills development would have to be adopted among educators, government and businesses, including addressing adult learning and encouraging a mindset of lifelong learning.

■ Chapter 7: Learning for a Better Future: Perspectives on Higher Education, Cities, Business & Civil Society – Piet Croucamp

Higher education as a universal concept is due for revision in methodology as well as philosophy. Technological innovation seems to be driving the awareness that existing models impose an extraordinary financial burden on the middle classes and, in the case of South Africa, inhibit accessibility to higher education. The current institutional model has for millennia been the standard as a universal method of transferring existing knowledge. This model is largely driven by public spending and delivers a standard product to the market. The need within the market, however, is a dynamic process that has to calibrate the output of higher education at great cost into an institutional memory that reproduces the competitive outcomes. It thus makes sense to involve actors within the economy at an earlier stage of the educational process.

The question, however, is to what extent is the 'human condition' compliant with the praxis of technological innovation, or are Artificial Intelligence (AI) and machine learning contrary to human nature? Such a question covers a very large field of research across many disciplines. This chapter by no means pretends to answer such a difficult question, and in that sense is more exploratory rather than explanatory. There might well be some degree of consensus that the human condition is set more deterministically than previously assumed and, therefore, is compliant with technological innovation in ways that not only allow for the generation of new technology but also for the more efficient use of existing knowledge. The other important research question deliberated is the capacity of technologically-driven education to lower the cost of generating

new knowledge and address the spatial arrangements of relocation towards educational institutions. The complicated nature of both these variables (cost as well as spatial relocation) could be resolved by business (the economy) being involved in a deterministic resolve to realign the method of knowledge transfer.

◼ Chapter 8: Rethinking the Post-School Education and Training (PSET) system to prepare the workforce for the 4IR world of work – Suzanne Hattingh

The Fourth Industrial Revolution (4IR), together with COVID-19, has forced countries across the globe into a new reality that has 'fundamentally (altered) the way we live, work, and relate to one another. In its scale, scope, and complexity, the transformation will be unlike anything humankind has experienced before' (Schwab 2015). Within this context, this chapter investigates the implications for preparing the workforce for the new world of work and the need to rethink and redesign elements of South Africa's Post-School Education and Training (PSET) system. The chapter analyses the impact of the 4IR technologies on job losses and the creation of high-skill jobs for which the current and new workforce will need to be prepared. The chapter reviews some of the predictions by the World Economic Forum, International Labour Organization, the World Bank and other organisations that are researching the changing nature of work and the 4IR workplace, as well as the skills needed for a productive workforce in this work context.

◼ Chapter 9: Digital credentials: discussions on fluency, data privacy and the recognition of learning in higher education beyond COVID-19 – Barbara Dale-Jones and James Keevy

Credentials have historically been thought of as tangible documents comparable to a driver's licence, a passport or a birth certificate.

In the educational sector, a credential can be something like a degree certificate or a school leaving certificate. It is customary in contemporary society that an individual proves his/her identity or achievements by sharing a credential in one way or another. The advent of COVID-19, and in fact even many new developments during the months preceding the pandemic, has starkly illustrated the fact that digital credentials are not only useful but even necessary for global citizenship and mobility (Dale-Jones et al. 2020). The chapter specifically positions the concept of self-sovereign identity as a key consideration for the education sector in the new digital age.

■ Chapter 10: Rationale for the internationalisation of higher education – Lizl Steynberg, Jan P. Grundling and Yuan Li

The chapter presents a dimensional and multivariate internatio nalisation conceptual framework for higher education. The framework offers various development discourse options to higher education institutions for pursuing local, international and global educational reputation and aspirations. The framework facilitates decision-making on a preferred internationalisation profile, given the contextual realities in which particular higher education institutions operate, their institutional missions and values, the local circumstances and their aspirations to be globally relevant. The chapter begins by contextualising the internationalisation of higher education from a process perspective. This is followed by a description of five dimensions that influence the internationalisation attempts of higher education institutions, namely institutionalisation, participation, quality, recognition and the core functions of higher education institutions. The last section discusses the multivariate nature of the internationalisation process, which consists of 11 constructs that act as mechanisms to individually or collectively strengthen or weaken the internationalisation dimensions of higher education institutions.

■ Chapter 11: Promoting age-friendly universities that engage new groups of older adults – Rob Mark

The diverse voices of older members of communities are outlined by Mark, indicating that they can play an essential role in bringing back the central questions concerning the role of universities in contemporary society and issues of access to higher-level knowledge. Universities have the potential to bridge disciplinary and geographic barriers to overcome the intellectual compart mentalisation that has often impeded later-life learning research and practice. In this chapter, a vision is outlined for later-life learning within the university, using the concept and strategic focus of the Age-Friendly University (AFU). The chapter explores how two universities worked together to develop shared ideas and principles about AFUs. The chapter lists the foundational elements of 10 AFU design principles, illustrating how the implementation of these design principles has transformed the universities to become lifelong learning universities for students of all ages.

Part 1
Sustainable cities and neighbourhoods in the global era

Progressing towards a good, human-centred, sustainable society

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■ Abstract

This chapter demonstrates that the world is currently at the cusp of radical changes happening in society, primarily brought about by the coronavirus disease 2019 (COVID-19) pandemic, rapid technological advances such as automation and artificial

intelligence (AI) and ageing populations with better longevity. In order to create a good, just and sustainable future society different from today's confusing and conflict-ridden world, traditional economic indicators are no longer adequate measures of sustainable development. Happiness and well-being should be placed at the centre of programmes aimed at building such good and sustainable societies, in which the needs of learning cities and regions are addressed concurrently with the needs of rural areas. Universities in Africa have a central role to play in designing such programmes and could well benefit from studies of similar programmes launched in other parts of the world. Africa does, however, pose unique challenges in that there is a lack of digital tools in the continent. Unique African solutions will therefore have to be sought through which good, human-centred, sustainable future societies can be established. Designing strategic, holistic development programmes that reach down to local neighbourhoods and bridge the divide between urban and rural areas can only be done through non-traditional partnerships between universities, councils, business, civil society and other institutions. This chapter explores the state of balanced, holistic development across key dimensions of sustainability, particularly in relation to happiness and well-being; the implications for Africa, the role of universities and connecting urban and rural areas in sustainable development and overcoming confusing and disconcerting global trends in building a good, sustainable future, particularly the challenges of being human in the era of the Fourth Industrial Revolution. It also provides examples of holistic development approaches and the need for reimagining learning communities in view of the COVID-19 pandemic.

■ Introduction

The world is currently in an extremely perplexing phase of human history. There is a basic ambiguity in what appears to be the big

picture. The eminent economist Jeffrey Sachs (2015) has summed up the current situation as follows:

> In our confusing, confused, and distracted world, we are running powerfully off course in many ways – climate change, the sixth great extinction, cities in danger, food supplies under threat, massive dislocations, widening inequalities of income, high youth unemployment, broken politics. (p. 505)

Nations are at the crossroads between a dying world order and the emergence of a new order. This is a transition marked by conflict, tensions and a sense of confusion between, for example:

- Globalisation and the revival of economic nationalism and geopolitics, particularly in the Asian region.
- The largely uncontrolled progress of science and technology in areas such as AI and automation, and increasing concerns for jobs to underpin the kind of society people know.
- In many countries, societies are becoming more individualistic, and people are concerned about the withering of social bonds that hold them together in communities and which support collective action for the common good.
- The impact of these influences has been enhanced by the destructive force of the COVID-19 pandemic.

So, is the world order moving towards a confusing world that is out of control, or step by step towards a just, human-centred and sustainable world? Does the future lie with a rerun of Mary Shelley's *Frankenstein* and disaster, or is there perhaps a less discernible trajectory towards a good, sustainable world? A current test of direction lies in how people respond to the United Nations (UN) Sustainable Development Goals (SDGs) to be achieved by 2030. These goals are directed at the big issues confronting world leaders in building a better world – ending poverty, eradicating epidemic diseases, ensuring food security, providing quality education for all and so on. In their totality, they provide a set of good ideas with an underpinning of ethics that could provide a framework for a better world.

Each of the UN's goals is a worthwhile aspiration and deserves support. But of particular interest is the statement by the UN that the SDGs are 'integrated and indivisible' (UN 2015) and linked to the concept that the three dimensions of sustainable development – economic, social and environmental – should be addressed in a balanced and integrated way. In its work on learning cities, the Place and Social Capital and Learning (PASCAL) International Observatory has been interested, for some years, in the idea of holistic, integrated development under a programme named EcCoWell. The concept refers to the integration of strategies across ecology and economy (Ec), community and culture (Co), and well-being and lifelong learning (Well). EcCoWell is a holistic approach to development that integrates health, well-being, learning and environment with community building, and is described later in this chapter.

Up to now, learning city initiatives have largely been developed for urban areas. However, if this agenda is to be achieved, the SDGs need to be also implemented in rural areas. Innovative concepts, such as entrepreneurial learning city regions, are emerging as ways to connect development in rural areas (Kearns 2018a).

■ The state of balanced, holistic development across key dimensions of sustainability in cities around the world

■ Balanced, holistic development

A useful guide to the state of balanced, holistic development in cities around the world is provided by an international study undertaken by the Arcadis organisation that applied a sustainable cities index to 100 cities (Arcadis 2016). This showed a dominance in balanced, sustainable development by northern European cities, although Singapore was ranked second. While the dominance of European cities stands out for reasons that bear reflection, it is the performance of Singapore at second place in

the rankings that is of particular interest. Singapore is a success story of a small island city-state that invested in the future. It is a story of a colonial past, a failed amalgamation with Malaysia and then the establishment of a successful development model that has since been exported to other countries.

When considering balanced, sustainable development, it is not enough to rely only on traditional economic indicators. The Arcadis report has the sub-heading 'Putting people at the heart of sustainability'. This should be the guiding principle. For example, when examining some indicators showing progress in ending extreme poverty, it is evident that China has made commendable progress. This reflects the rapid industrial development in China and the impact of urbanisation as a result of which large numbers of people move from poverty-stricken rural areas to cities for jobs. However, these indicators do not tell the entire story. If a more balanced picture of progress towards a just and sustainable world is sought, the social dimension of sustainable development should be probed a little further, including addressing the question of happiness and well-being.

■ Happiness and well-being at the centre of sustainable development

The field of psychology sheds some light on the question of happiness, including the crucial distinction between pleasures and gratifications. Pleasures refer to the bodily pleasures that come through the senses and are momentary in time. Gratifications, on the other hand, engage us fully so that we are immersed and absorbed in them. They give meaning to our lives (Seligman 2002:102–121).

This is an important distinction for learning cities and communities. While pleasures can play a useful role in bringing happiness into learning cities, for example, through cultural festivals, gratifications derived from activities such as volunteering for worthy causes bring a more lasting sense of happiness and well-being and add meaning to lives (Kearns 2018b).

In building good, sustainable communities, activities that provide community gratification are required. The UN's 2030 Agenda for Sustainable Development highlights the fact that providing good measures of progress towards sustainable development goes beyond the traditional economic indicators and also covers the social dimensions of sustainability. This has led to considerable interest in measuring changes in levels of happiness and well-being in communities. In response to this need, the World Happiness Report produced by the Sustainable Development Solutions Network is published every year since 2012. This initiative reflects the growing recognition that happiness should be seen as 'the proper measure of social progress and the goal of social policy' (World Happiness Report 2017:3). The Organisation for Economic Co-operation and Development (OECD) (2016) has joined this trend and in June 2016 committed itself to 'redefine the growth narrative to put people's well-being at the centre of government's efforts'. Both personal and social happiness should be viewed as fundamental objectives of development and appropriate policies need to be designed to achieve these objectives. In the 2016 World Happiness Report, Helliwell, Layard and Sachs (2016) support this view:

> While the language of the 2030 Agenda is about goals, timelines, human rights and sovereign responsibilities, the agenda clearly embodies an implicit theory of human well-being, specifically that well-being will be fostered by a holistic agenda of economic, social, and environmental objectives, rather than a narrow agenda of economic growth alone. (p. 60)

The World Happiness Report 2017 shows an interesting cluster of countries as the best performers with respect to the happiness of their people. The outstanding feature in this regard is that five of the 10 best performers are the Scandinavian countries, namely Norway, Denmark, Finland, Iceland and Sweden, with Switzerland, the Netherlands, Australia, Canada and New Zealand also belonging to the top group. The same countries were in the top 10 in the 2020 report except for Austria replacing Australia. The 10 countries at the bottom of the list from 2017 to 2019 are India,

Malawi, Yemen, Botswana, Tanzania, Central African Republic, Rwanda, Zimbabwe, South Sudan and Afghanistan, with South Africa positioned at number 109 out of 153 countries (Helliwell et al. 2020:20–22).

The 2017 report observed that there are six variables related to different aspects of life that influence the assessment of happiness:

1. gross domestic product (GDP) per capita
2. healthy life expectancy
3. social support
4. trust
5. perceived freedom to make life decisions
6. generosity.

The research team concluded that the top 10 countries ranked high on all six of these factors. In addition to these six variables, the 2017 study also found that the top countries ranked high on the main factors found to be in support of happiness – caring, freedom, generosity, honesty, health, income and good governance. The poorest countries are among the least happy countries, adding the inequality of happiness to the growing list of inequality concerns.

The November 2017 issue of *National Geographic* compared happiness in Denmark, Singapore and Costa Rica, showing that it is possible to enhance happiness in different ways:

• Denmark illustrates the typical Scandinavian approach to social democracy with concepts such as *hygge*, and strong lifelong learning, building a culture and society that protects individuals from unhappiness (Linnet 2011; Wiking 2016).
• Singapore illustrates the impact of a strong strategic approach to economic, social and environmental development sustained over time by leadership.
• Costa Rica shows a different approach to happiness in a Latin American context and encourages a balanced approach to life

and work with joy, health, faith and family being central (Beuttner 2017).

I contend that the World Health Organization's (1998) definition of a 'healthy city' could describe a 'learning city', as it illustrates the close connections between health and learning:

> A Healthy City is one that is continually creating and improving their physical and social environments and expanding those community resources which enable people to mutually support each other in performing all the functions of life and developing to their maximum potential. (p. 13)

■ Healthy learning cities

Where healthy city and learning city initiatives exist in a city, a range of joint projects can be undertaken to advance health and learning objectives at the same time. In many cities, such collaboration can be given a structure where health and learning objectives exist in strategic planning for the city. Typical examples of joint projects include addressing mental health in youth; health and learning objectives in active ageing; health, learning and gender equity; health and learning objectives in age-friendly cities and using the internet for health and learning information (Kearns 2018a).

The Medellín Manifesto: Learning Cities for Inclusion is an example of a global initiative supported by private and public entities in 100 cities across 60 countries who are committed to inclusion as a principle for lifelong learning and sustainable cities. The manifesto (UNESCO Institute for Lifelong Learning 2019) affirms:

> [*T*]hat sustainable development can only be achieved if lifelong learning opportunities are available to all learners, across all age groups and levels and types of education, regardless of modality, space and motivation for learning. (p. 2)

Another global initiative is the 2017 UNESCO Cork Call to Action on Learning Cities under the theme 'Global goals, local actions:

Towards lifelong learning for all in 2030'. It was supported by diverse organisations in 180 cities in 80 countries who 'aspire to build mindful learning cultures in our cities that foster global consciousness and citizenship through local action to implement the SDGs' (UNESCO Global Network of Learning Cities 2017a:1). The Cork Call to Action 'recognises that education and lifelong learning are at the heart of the SDGs and indispensable for their achievement' (UNESCO Global Network of Learning Cities 2017b:1). The statement expresses commitment to achieving sustainable development in all its dimensions, recognising the links between all of its social, environmental and economic aspects in order to secure a sustainable future for all. The call to action endorsed three key themes for learning city development: green and healthy learning cities, equitable and inclusive learning cities, and decent work and entrepreneurship in learning cities (UNESCO Global Network of Learning Cities 2017a:1–3).

■ Implications for Africa, the role of universities and connecting urban and rural areas in sustainable development

■ The importance of conscientisation in building sustaining learning communities in Africa

Before examining the implications of the above for Africa, the role of universities and connecting urban and rural areas in sustainable development, the related matter of why learning cities have never been sustained in Africa must be addressed. How can better approaches that work in Africa be found, and which are relevant to both urban and rural areas?

The question of why learning cities have never been sustained in Africa is addressed in a 2012 paper produced by Abel Ishumi, in which it is argued that strategies have to be culturally

appropriate for African contexts (Kearns & Ishumi 2012). The following year Idowu Biao from the University of Botswana was commissioned to address this same question in a special issue of UNESCO's International Review of Education. Biao references some ideas raised by the Brazilian educator Paolo Freire and argues that initiatives have to be based on conscientisation. Conscientisation is 'the process of developing critical awareness of one's social reality through reflection and action' (Biao, Esaete & Oonyu 2013:476). Conscientisation is indeed a requirement in building sustainable learning communities in Africa that serve both urban and rural areas.

The importance of conscientisation in building good, sustainable communities leads to the related idea of mindful societies, which is described by Sachs in his book *The Price of Civilisation* as follows: 'We need a mindful society in which we once again take seriously our own well-being, our relations with others, and the operation of our politics' (Sachs 2012:162).

While the concepts of conscientisation and mindful societies both contribute something of value in building good societies, a response to the needs of urban and rural areas should be addressed in an integrated way. That is, learning regions that link urban and rural areas, rather than simply learning cities, needs to be examined. This undoubtedly brings further complexity in terms of governance, finance and other aspects, but this perspective is necessary. I argue that there is a need to find effective ways to connect urban and adjacent rural areas for learning city and region development, including the use of digital technologies, the roles of universities and colleges and collaborative governance arrangements (Kearns 2018a).

■ The role of universities in the context of sustainable development objectives

Universities play an important role in fostering and supporting lifelong learning opportunities for all – a key foundation for

advancing the UN's 2030 Agenda for Sustainable Development and building a better world. The role of universities in fostering lifelong learning was the subject of a paper by Francoise De Viron and Pat Davies (2015) based on the experience drawn from European universities. In their paper, they make a distinction between university lifelong learning and lifelong learning universities. The former is better known as continuing education, while the latter conveys a more comprehensive implementation of lifelong learning (De Viron & Davies 2015:41–42). They envisage the progress of universities towards the broader objective of becoming lifelong learning universities as involving three developmental stages: an adoption stage, an organisational stage, and a cultural stage when lifelong learning is fixed within the DNA of the university. The authors conclude that, as of now, few European universities are at the cultural stage. It is doubtful whether African universities differ from European universities in this regard.

If a major expansion of lifelong learning opportunities for all across Africa is sought, there could be other ways to harness the contribution of universities. A good option for Africa might be found in the city of Beijing. The Beijing learning city has been developed at three levels: the city level, the administrative district level (with 16 districts), and the neighbourhood level. Partnering with the Beijing City Council, the Beijing Normal University is intimately involved in policy formulation and research for the initiative, with lifelong learning then delivered at the district and neighbourhood levels by colleges and centres. In this way, lifelong learning opportunities are created for large numbers of people.

While the university's role is central in the Beijing learning city, so too are the roles of each of the partners in this initiative, including community colleges. The role of community colleges is even more important in the Taipei learning city in Taiwan, where a community college has been established in each of the 12 administrative districts of the city. These community colleges differ from the norm in that they do not award credentials. They

do, however, have two objectives fundamental to building a sustainable democratic society, namely to provide lifelong learning opportunities for all and to promote citizenship and community. The partnership of universities, councils and community colleges can be creative and powerful. Empowering local neighbourhoods to take initiatives towards a good future for the community is a critical step towards a just and human-centred future.

■ Challenges and opportunities in the digital era

However, a particular problem that exists in building such partnerships lies in extending the tools of the digital era to everyone. South African statistics reflect the great uptake in the use of smartphones in Africa, but also highlight the disconnect in the use of the internet. Other countries face a similar problem experienced particularly by older people which requires new approaches and partnerships. An initiative in Australia illustrates the potential for doing so. This programme entitled 'Tech Savvy Seniors' was directed at meeting the needs of older Australians for gaining internet skills through a partnership led by Australia's main telecommunications company, Telstra. Telstra works with the state library in three states, thereby utilising large numbers of local council libraries as delivery sites for the programme. The digital age needs partnerships such as this, as well as creative ideas, to widen learning opportunities for all.

A key need then is to find low-cost ways to bring lifelong learning opportunities to large numbers of people in ways that suit the African context. A good example of this is provided by Tanzania's folk development colleges that were established in 1975 based on the model of Swedish folk schools. Another interesting precedent exists in Africa in the millennium villages project, with villages in 10 countries across sub-Sahara Africa innovating in developing ways to implement the UN Millennium

Development Goals. This led to some good innovations in low-cost health provision to villages.

While Africa generally has a young population at present, this will change with the UN statistics showing a significant ageing of the population by 2050, with a 228.5% increase in the population aged 60 and over, a higher rate of increase than any other region in the world (UN 2017). This impact will challenge government and civil society in preparing for the transition to a longevity society (eds. Kearns & Reghenzani-Kearns in press).

Partnerships between universities, councils, business, civil society and other institutions, such as community colleges, are important in designing strategic, holistic development programmes that reach down to local neighbourhoods and bridge urban and rural areas. While building sustainable local communities is fundamental, this has to run parallel with global consciousness and competence, as well as a concern for the future of the planet. The OECD recently decided to add 'global competence' to the programme for international student assessment study on school performance, recognising that schools should teach young people to 'support the development of peaceful, diverse communities' (OECD 2016:3). Universities, no less than schools, should contribute to the great project of building a good, human-centred and sustainable society.

The psychologist Emily Smith argues that there are four pillars on which a sense of meaning and purpose in our lives are built, namely belonging, purpose, storytelling and transcendence (Smith 2017:41). The inclusion of storytelling reflects the importance of storytelling in many cultures throughout history, from the ancient Greeks and Celts to Australian Aborigines and many of the cultures of Africa. The transcendence pillar is a reminder of the need to go beyond local concerns to foster attitudes such as global consciousness and empathy, as well as a sense of our common humanity and destiny. This is a further challenge for educators and community leaders.

South Africa has a distinctive contribution to make in building global consciousness and empathy. The concept of *Ubuntu*, meaning humanity and the idea that 'we affirm our humanity when we affirm the humanity of others', points the way towards a truly global empathic civilisation. It is a worthy pursuit to foster partnerships, particularly non-traditional partnerships, with collaboration at all levels in building the moral, institutional and cultural foundations for a good future, whatever that future may hold. Universities can have an important role to play in this great and necessary adventure.

■ Overcoming confusing and disconcerting global trends in building a good, sustainable future

■ Challenges of the Fourth Industrial Revolution

The emerging world of automation and AI is seen by many as threatening to jobs and the basic underpinnings of the kind of society familiar to all. Certainly, the emerging world of augmented intelligence and intelligent robots deserves careful attention in foreshadowing a further revolution in the human condition. In his appropriately named *Homo Deus: A brief history of tomorrow*, the historian Yuval Harari examines the emerging world of 'post-humanist technologies' – a world dominated by machines (2016). So, are we moving to a fourth revolution in the human story that started when homo sapiens left Africa? What can be done in the face of these trends?

The previous industrial revolution that started in Britain in the 19th century transformed a rural agricultural society into a world of chaotic industrial towns and cities with appalling living and working conditions for most people. This was a world out of control, with technology and the market running ahead of the capacity of people and their governments to keep pace and build

a good society. While the industrial revolution – with democracy as its companion – eventually brought significant benefits to large numbers of people, the process of change left governments and their communities confused and trailing behind change. So, there is a case to be made for preparing for the coming revolution in the human condition so that we can respond to whatever challenges we face and manage the transition more effectively than during the First Industrial Revolution. In doing this, there is a need to think imaginatively about the past and the future.

Six developments appear to be particularly relevant to South Africa – and perhaps to Africa more generally – in preparing for the future. These are:

1. actively fostering lifelong learning for all
2. building partnerships along the lines mentioned earlier
3. strengthening and empowering communities and citizenship
4. doing everything possible to achieve the UN SDGs
5. extending digital literacy for all
6. building a mindful, learning culture in communities.

These are all worthy objectives that will add much to the development of learning cities. However, the challenge lies in how to convert these objectives into integrated, holistic action. What are the connectors between these objectives? As the familiar world moves ever closer to the full impact of the fourth great revolution on the human condition, widespread conscientisation in mindful learning communities will be a fundamental prop for a managed transition driven by human values and needs. Mindful learning communities are resilient communities able to adapt to change and support each other.

The World Economic Forum has given considerable attention to the evolving implications of the Fourth Industrial Revolution. A useful entry point to understanding those implications suggested by Klaus Schwab is to distinguish between human and machine intelligence. Schwab's concept of human intelligence comprises contextual, emotional, inspired and physical intelligence

(Schwab 2016:106–111). Working our way through how we build these forms of human intelligence in our communities is a good starting point in the journey towards a good, human-centred, sustainable society. Schwab defines this process as 'empowering individuals and communities, providing them with meaning and the agency to shape the world' (Schwab 2018:228).

Being human in the era of the Fourth Industrial Revolution and artificial intelligence

In my contribution to the PASCAL International Observatory, entitled 'Being human in the era of the fourth industrial revolution and AI', I (see Kearns 2019a, 2019b) describe my view as follows:

The revolutionary changes in digital technologies associated with artificial intelligence, robotics and biotechnologies are impacting on society with this impact certain to increase. In this section, the impact of these changes on being human is explored.

What does it mean to be human in the context of the emerging machine age of the Fourth Industrial Revolution driven by artificial intelligence, robotics and biotechnologies? How do we distinguish human intelligence from machine intelligence? How do we use lifelong learning and community building strategies to enhance essential human attributes and needs in the looming machine age?

If the pessimistic forecasts of the impact of artificial intelligence on employment are realised – or even partly realised – the critical challenge is to create a society that does not degenerate into self-destructive behaviour. What can be done to harness lifelong learning strategies to develop well-being-inducing strategies that add meaning and purpose to lives? A shift is needed in our thinking towards the needs of a thriving low-employment society and the steps that need to be taken in this transition phase in asserting the things that make us human.

Can we, however, make the leap from good active ageing to good active living in all stages of life fuelled by the four types of human

intelligence identified by Schwab, namely contextual, emotional, inspired (meaning spiritual) and physical? So, in terms of the subject of this chapter, 'learning to be becomes learning to be human'. The process of lifelong learning should be directed at the qualities that make us distinctively human with the four intelligences identified by Schwab being expressed in imagination, compassion, empathy, autonomy, citizenship and creativity, so as to give meaning and purpose to our lives and empowerment to individuals and communities. (n.p.)

■ The EcCoWell approach for holistic development

PASCAL developed the EcCoWell concept in 2012 as an approach to holistic and integrated development in learning cities. The core of EcCoWell development is focused on the integration of health, well-being, learning and environment with community building, which has much in common with UNESCO's 'Cork Call to Action on Learning Cities'. EcCoWell also provides a good entry point for implementing the UN's SDGs in an evolutionary approach as linkages are forged with other SDGs over time. A central feature of the EcCoWell approach is the need to build a sense of meaning and purpose into people's lives in order to enhance their happiness and well-being and the values of the communities in which they live (Kearns 2018a). EcCoWell communities and cities address balanced, holistic development across economic, ecological, community, well-being and lifelong learning objectives.

Kearns and Reghenzani-Kearns (eds. 2018) put it as follows:

The city of Cork has been an international leader in learning city development oriented to EcCoWell principles, and, along with Taipei, they have been leaders in applying EcCoWell concepts in their projects. The concept of green healthy learning cities in the Cork call to action reflects the EcCoWell core strands as a basis for learning city development that is inclusive and equitable, and which fosters entrepreneurship and decent work. The EcCoWell

> experience in Taipei and Cork has shown the value of community projects in building a sense of belonging through collaboration in projects that have value for the whole community. The Taipei projects included wetland restoration, building a community woven bamboo performance house and creating a 'happy farm' for the community, while the Cork projects in Ballyphehane and Knocknaheeny showed Cork applying EcCoWell principles in two very different neighbourhoods. (n.p.)

The holistic approach to learning cities which has been developed by PASCAL in its work on EcCoWell, has been taken further in the EcCoWell 2 concept that adds happiness to the original EcCoWell dimensions (Kearns 2018b). The EcCoWell 2 experience will be significant in confirming whether a holistic approach to learning city development brings benefits in enhanced happiness and well-being (Kearns 2019a):

> Several local neighbourhoods participating in the EcCoWell 2 community revival programme illustrate this local neighbourhood innovation model. These include the Harlem New York EcCoWell 2 project and the Datong Taipei learning neighbourhoods that have been creative leaders in examining ways to build innovative learning neighbourhoods in communities that experience considerable disadvantages. In each case, an institution applied EcCoWell 2 principles to engage the community in a broad cross-sectoral approach across areas such as the arts, environment, culture, health and well-being. (n.p.)

A good example of an EcCoWell 2 project that links the arts, community and environment is provided by the activities of the Wallis-Ortz Gallery and Centre in the Harlem neighbourhood of New York. Kearns and Reghenzani-Kearns (eds. 2020), in their contribution 'Connecting Up in a World of Turbulent Change: Report of the PASCAL EcCoWell Community Recovery Program', describe this 'initiative explored how the arts and place-based learning can be harnessed in transformative ways directed at community and environmental objectives' as follows:

> This involved the community considering how to revitalise the outdoor public space of a partner, Fresh Oils Ministries, and then developing opportunities in these spaces that could enhance the sustainability of the community. (p. 2)

EcCoWell 2 has also been used to promote entrepreneurship in communities as a key element of building an enterprising culture for neighbourhoods to be able to adapt to change (Kearns 2020):

> Youth social enterprises provide a further example, such as Brimbank in Melbourne where a youth centre served as a hub for initiating and supporting youth social enterprises. The EcCoWell 2 development in the Datong district of Taipei shows how entrepreneurship can be fostered from the cultural resources of the community. This initiative built on the rice food tradition of the country and led to a rice food theme pavilion being set up in the Kuoshun neighbourhood of Datong. While the pavilion served as a rice food learning site, it also operated as a micro-business. This is similar to the role of the Brimbank youth centre in supporting youth social enterprises.
>
> Collaborative community projects such as these can have considerable value in connecting up community organisations, education institutions, businesses, and other stakeholders in neighbourhoods. If well chosen, they can be used to promote the integration objectives of EcCoWell 2, and build communities that are green, healthy, learning communities. Community projects can link to other initiatives such as community gardens and farms that foster a sense of community, and help to build social coherence and resilience. Community projects can also be used to deepen the learning experience of residents in their consciousness of local and global citizenship, and the role of the individual. Good community projects can bring meaning to lives through a sense of being deeply connected to other people in progressing shared community objectives. (pp. 1–3)

I believe that the EcCoWell principles can be applied in any combination of sectors, provided that ongoing learning and community building informs and adds value to the connections (Kearns 2020). The pattern of connections is likely to depend on the particular strengths and resources of a community. This approach can be applied in a holistic way to implement the UN SDGs (Kearns 2020):

> The experience of Cork has shown the value of green, healthy learning communities as a starting point for building connections towards a holistic vision. In other cases, cultural institutions functioning as community learning centres can provide a good launching pad offering creative opportunities for imaginative links. (pp. 2–3)

■ Reimagining learning communities in a context of permanent transition

PASCAL organised an EcCoWell Community Recovery Program in 2020 to test if the EcCoWell concept had value in supporting communities in recovering from the COVID-19 pandemic. A small number of learning cities, districts/neighbourhoods participated in the Program, together with Glasgow University and the Beijing Academy of Educational Sciences. Profiles of the participants, with reports from all, with a commentary on insights gained from the Program are recorded in the report *Connecting Up in a World of Turbulent Change*, which is available on the PASCAL website (eds. Kearns & Reghenzani-Kearns 2020).

Insights from the Program are grouped under six topics:

1. supporting individual well-being in adjusting to ongoing change
2. building resilient communities with social cohesion
3. promoting consciousness of global interdependence
4. harnessing technology to serve human purposes
5. implications for learning cities
6. connecting up for the further development of the EcCoWell concept.

These insights pointed to the centrality of well-being in an era of perpetual change, and the key roles of expanded partnerships, imagination and empathy as driving forces towards a just, human-centred, sustainable world. The EcCoWell report also showed the need to reimagine the concept and role of learning cities and neighbourhoods in an era of turbulent change and disruption to traditional ideas and habits.

This imperative aligns with the initiative of UNESCO in establishing the International Commission on Education Futures which is to report by the end of 2021. In establishing the Commission, UNESCO urges that we 'reimagine knowledge, education and learning in the looming environment of a world of increasing complexity, uncertainty and

precarity' (UNESCO 2019:1). There is much in participant reports in the EcCoWell Community Recovery Program that can be taken up and developed in this process of reimaging the concept and role of learning cities and neighbourhoods in a world of increasing complexity, uncertainty and precarity.

Recovery from the COVID-19 pandemic in communities will need to address the range of psycho-social issues resulting from the pandemic, including an increase in isolation, anxiety and depression (Kearns 2020). Rebuilding social cohesion, inclusion and community in the aftermath of the pandemic will present a daunting challenge requiring fresh ideas, strengthened partnerships and vision and leadership. The recovery of communities from the social and economic effects of the COVID-19 pandemic provides an opportunity to apply revised EcCoWell 2 principles to strengthen the social infrastructure, resilience and well-being of communities. A range of social and psychological effects will need to be addressed. These may include an epidemic of loneliness and mental illness, rising unemployment, loss of confidence and a sense of meaning in life, as well as the further breakdown of vulnerable groups. An expanded EcCoWell 3 development in 2021 will address a number of these challenges, including a focus on learning, health and well-being and the extension of learning neighbourhoods into more communities.

■ Conclusion and recommendations

The chapter explores the importance of a balanced, holistic approach to ensure healthy, learning cities that promote and are aligned with the SDG goals. These goals provide measures for progressing towards sustainable development that goes beyond the traditional economic indicators and also cover the social dimensions of sustainability. This is particularly relevant in the emerging world of post-humanist technologies dominated by machines, which requires lifelong learning and community building strategies to enhance essential human attributes and needs. This

should contribute towards personal and social happiness being recognised as fundamental objectives of development.

This chapter highlights the relationship between healthy cities and learning cities and discussed projects that have been undertaken to progress health, well-being and learning objectives simultaneously. These include projects that follow the PASCAL EcCoWell approach for holistic development that integrates health, well-being, learning, environment, community building and happiness. The key challenge for Africa is finding effective ways to connect urban and adjacent rural areas for learning city and region development, including the use of digital technologies, and preparing for the challenge of an ageing population in the emerging longevity era.

The increased significance of happiness and well-being in the context of sustainable development objectives has a range of implications for learning city policy and practice in order to integrate happiness into sustainable learning cities. Therefore, happiness should be an explicit objective in learning city development, drawing on insights from the World Happiness reports and positive psychology and related disciplines. Such strategies should recognise the value of gratifications for well-being in all stages of the life cycle.

Learning cities should aim to bring a sense of purpose and meaning into peoples' lives, with collaborative community projects having a particular value. The mounting evidence on happiness and well-being points to the value of local community action, such as learning neighbourhood initiatives, in bringing a sense of belonging and purpose to lives. Research is showing the importance of place in fostering happiness and well-being; this should be a key objective in learning city planning. Learning cities should aim to build a mindful learning culture that combines personal development and local action with fostering empathy and global consciousness.

The ideas imparted by education, or released in the mind through education, should therefore be liberating ideas; the skills acquired by education should be liberating skills in order to achieve a sustainable, human-centred future for all humankind.

Sustainable, healthy, learning cities and neighbourhoods[3]

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■ Abstract

This chapter presents the findings of the work of the Centre for Sustainable, Healthy and Learning Cities and Neighbourhoods (SHLC) that is funded via UK Research and Innovation as part of the UK Government's Global Challenges Research Fund (GCRF). The chapter is based on case study research conducted in two cities in each of the seven countries in the Global South.

The cities are Cape Town and Johannesburg (South Africa), Dar es Salaam and Dodoma (Tanzania), Kigali and Huye (Rwanda), Delhi and Madurai (India), Dhaka and Khulna (Bangladesh), Chongqing and Datong (China) and Manila and Batangas (Philippines). Based on an analysis of data drawn from planning and urban development policy documents in the respective countries over the last two decades, the case studies identify key ideas and policies that have shaped the delivery of public services, especially education and health care. The chapter focusses on four themes: urban inequalities, urban planning policies, understanding health and well-being and learning cities.

■ Introduction

This chapter presents the findings of research conducted by the Centre for Sustainable, Healthy and Learning Cities and Neighbourhoods (SHLC) which was based on case studies conducted in 14 cities. The cities are all in countries that form part of the Global South, which broadly refers to the regions of Latin America, Asia, Africa and Oceania that are outside Europe and North America and are mostly low or middle-income countries. The case studies were prepared by SHLC collaborators, that is Abrahams et al. (2018), Kundu, Pandey and Sharma (2018), Moshi, Msuya and Todd (2018), Delos Reyes et al. (2018), Shilpi Roy et al. (2018) and Jaganyi et al. (2018) and covered two cities in each of seven countries as indicated in Table 2.1.

This chapter provides some initial analysis of the case studies of each of the cities in Table 2.1. These case studies were based on extensive analysis of existing data (see Delos Reyes et al. 2018) drawn from 'planning and urban development policy documents for the last two decades, identifying the key ideas and policies that have shaped the delivery of public services', especially education and health care. The findings of the case studies are divided into four overarching themes: urban inequalities, urban planning policies, understanding health and well-being, and learning cities.

TABLE 2.1: Countries and case study cities.

Region	Country	Case study cities
Africa	South Africa	• Cape Town (parliament seat capital) • Johannesburg (major city region)
	Tanzania	• Dar Es Salaam (national city and financial centre) • Dodoma (regional city)
	Rwanda	• Kigali (capital) • Huye (regional city)
South Asia	India	• Delhi (capital) • Madurai (regional city)
	Bangladesh	• Dhaka (capital) • Khulna (major regional centre)
East Asia	China	• Chongqing (national city in the west) • Datong (regional, inland and north)
	Philippines	• Manila (capital) • Batangas (regional)

The University of Glasgow led the collaboration with nine research partners, and the project aimed at strengthening the 'capacity to address urban, health and education challenges in neighbourhoods across fast-growing cities in Africa and Asia' (Delos Reyes et al. 2018). The other collaborators are the Human Sciences Research Council, Ifakara Health Institute, Khulna University, Nankai University, National Institute of Urban Affairs, University of Rwanda, University of the Philippines Diliman and the University of the Witwatersrand.

■ Urban inequalities in the global south

Inequalities pose major contemporary development challenges. This is made explicit in the United Nations (UN 2015) SDG 10 that seeks to 'reduce inequalities within and among countries'. Inequality in the context of the SDGs relates to opportunity, income and power, and is experienced disproportionally by certain groups in society by virtue of their individual and situational characteristics. The nature of inequalities differs from one context to another. For instance, one region may have inequality in access to the labour market, whereas in other regions, inequalities may be more evident in housing markets

and access to services such as transportation, education or health. Such inequalities are often interlinked, and individuals may also experience social exclusion for multiple reasons and from multiple forms of opportunity. Furthermore, particular groups may experience the effects of the exclusion that inequitable access brings by virtue of their race, ethnicity, gender, class, caste and disability, among many other characteristics that they possess. Many individuals carry multiple characteristics that make them more likely to be socially excluded and experience inequitable opportunity (Tefera, Powers & Fischman 2018).

Inequalities are traditionally measured in economic terms such as income and consumption expenditure, which is the focus of this section. However, inequalities are also experienced, and can be assessed, through the lenses of access to education, and health and well-being, which are the foci of later sections in this chapter. We therefore seek to reflect the multiple factors that impinge upon inequality and how this shapes differences between cities, and within them at neighbourhood level. This is a perspective which, as Tammaru et al. (2016) argue, received relatively little attention in urban literature.

■ Inequality and its correlates in case study cities

Income or consumption expenditure inequality as represented by the Gini coefficient reveals the existence of significant inequality across the 14 case study cities (see Table 2.2), where city population size varies between 0.23 million and 26.7 million, with the exception of Huye, a small town in Rwanda with an urban population of less than 50 000. The average area of the cities is 370 km^2, with the smallest city size being 15 km^2 and the largest 1212 km^2. The average Gini coefficient is 0.41 and varies between 0.31 and 0.63. These values suggest that the magnitude of inequality doubles between the most (Dhaka) and the least

TABLE 2.2: Descriptive statistics of the case study cities, *c.* 2015.

Variable	Observations	Mean	s.d.	Minimum	Maximum
Population (million)	13	7.59	9.66	0.23	26.70
Area (km²)	13	369.44	405.69	15.32	1212.73
Density (person/km²)	14	17027.81	8820.96	565.00	33663.10
Pop. growth rate (annual)	13	2.55	1.63	-1.48	5.58
Poverty rate %	14	12.25	13.66	0.96	46.60
Unemployment rate %	14	11.50	8.61	2.90	28.20
Gini coefficient	14	0.41	0.10	0.31	0.63
HDI	14	0.67	0.09	0.48	0.76
GDP per capita ($)	13	6241.95	3650.50	1121.48	12697.15

Source: Florczyk et al. (2019); see also https://globaldatalab.org.
GDP, gross domestic product; HDI, Human Development Index.

(Johannesburg) equitable cities. Similarly, the case study cities show significant variations in poverty rate, unemployment rate, Human Development Index (HDI) and GDP per capita.

Table 2.3 presents correlation coefficients of selected socio-economic variables among the case study cities (n = 14). The direction of all coefficients is as expected. Inequality is positively correlated with the unemployment rate, city size and population growth rate, while negatively correlated with density, population size, poverty rate and the HDI. However, only the negative association between inequality and the unemployment rate is statistically significant. As expected, the HDI score increases with density and GDP, and decreases with the incidence of poverty.

Figure 2.1 presents the relationship between inequality as expressed by the Gini coefficient and unemployment rate. It reveals that higher unemployment is associated with higher income or consumption expenditure inequality. Johannesburg, Cape Town and Kigali have the highest share of unemployment and are also the most unequal cities in terms of income and consumption expenditure. However, Dar es Salaam has similar levels of unemployment but is a reasonably equal city. There are

TABLE 2.3: Correlation coefficients of socio-economic variables of the case study cities, c. 2015.

Socio-economic variables	Population	Built area	Density	Population growth rate	Poverty	Unemployment	Gini	HDI
Population size	1							
Built size	0.87***	1						
Density	0.61**	0.24	1					
Population growth rate	0.21	0.31	–0.15	1				
Poverty rate	–0.21	–0.28	–0.37	–0.46	1			
Unemployment rate	–0.17	0.13	–0.13	0.31	–0.19	1		
Gini coefficient	–0.23	0.13	–0.42	0.12	–0.08	0.82***	1	
HDI	0.38	0.41	0.56**	0.27	–0.82***	0.12	–0.01	1
GDP per capita	0.36	0.55*	0.04	0.20	–0.67**	–0.05	0.16	0.73***

Source: Florczyk et al. (2019); see also https://globaldatalab.org.
Note: Number of observations: ~14; *, $p < 0.1$; **, $p < 0.05$; ***, $p < 0.01$.
GDP, gross domestic product; Gini, Gini coefficient; HDI, Human Development Index.
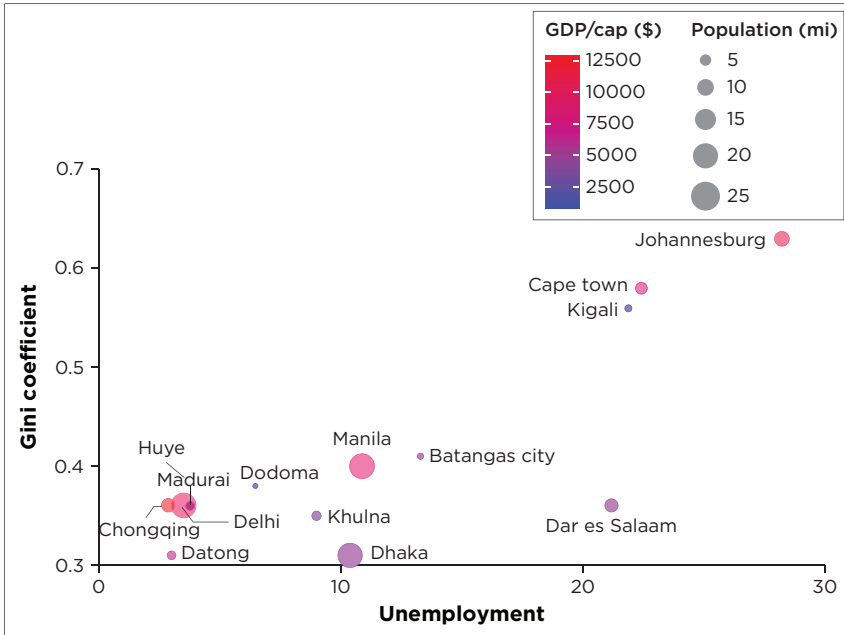
Source: Florczyk et al. (2019); most data come from https://globaldatalab.org.
FIGURE 2.1: Inequality versus unemployment in cities, *c*. 2015.

mixed relationships between inequality and population size or economic level. For instance, a relatively smaller city may have high inequality (e.g. Kigali), and a city with a low economic base may have less inequality (e.g. Dhaka).

■ Inequalities beyond income or consumption expenditure

Inequalities exist in multiple forms from one case study city to another. Such inequalities are notably highest in African cities, particularly South African cities (see Figure 2.1). The content of SHLC city reports, together with other studies, suggest four major forms of inequality beyond income or consumption expenditure:

1. **Informal built environment –** Urban inequalities are clearly manifest in the built environment, particularly in the type of dwelling units and access to basic urban services, such as water and sanitation. In the Global South, a large share of the population lives in some form of informal housing. For example, in Kigali 80%, and in Delhi more than 50% of households live in informal units (Ahmad et al. 2013). Some of the built environments of the case study cities are composed largely of slums – arguably the worst form of informal housing. For instance, over one-third of the population of Dhaka and over a quarter of those in Manila and Madurai live in slums. 'Informal settlements are sites of struggle because of the large population, competition for resources and inadequate provision of services. Service delivery protests are a common occurrence' (Abrahams et al. 2018:71).

2. **Informal employment –** One of the reasons for the poor quality of the built environment is the poor socio-economic base of cities in the Global South. Many cities have high unemployment rates, as high as 28.2% in Johannesburg and 22.4% in Cape Town, which contributes to economic inequality. At least one member of Tanzania's 4.3 million households out of a total of 10.2 million engages in some informal sector activities, which accounts for the second-highest contribution to employment (Moshi et al. 2018). Similarly, one-fifth of employment in Johannesburg is in the informal sector, compared to the overall 10% of the South African total workforce that is in the informal sector (Abrahams et al. 2018). Workers in the informal sector do not enjoy the protection of labour legislation, other forms of social protection or benefits.

3. **Access to education and health care facilities –** Access to education and health care facilities plays a critical role in bridging inequity. In many parts of the world, there is at least basic access to such services irrespective of socio-economic status, and as a result, there are some prospects for reducing intergenerational inequality. However, considerable inequalities exist in access to health and education (at all levels) that is spatially determined, and this is particularly prominent in cities

in the Global South. The spatial component of exclusion is, of course, layered with many other factors. The India case study, for example, shows how caste dynamics limits access to education (Kundu et al. 2018).

4. **Absence of inclusive urban governance –** Inclusive (or good) governance is one of the most important factors for bridging inequality in the cities of the Global South (Baffoe, Ahmad & Bhandari 2020; Desai & Potter 2013:276). Given the limit on resources that cascade down to city administrations, it is usually the higher levels of government – national or provincial – that provide a more significant direct and indirect impact on addressing urban inequality. The Nobel Prize winner Joseph Stiglitz (2015) argues that inequality exists because of political choices that can be addressed through appropriate policies and programmes. Doyle and Stiglitz (2014) also provide compelling arguments for the elimination of inequalities contextualised within the Millennium Development Goals and SDGs, using economic, political and social arguments.

In summary, preliminary findings suggest that national-level inequalities are also reflected in cities. This is particularly the case in South Africa, as a consequence of structures developed during the apartheid era. Within the Global South, there is a wide variation in income or consumption expenditure inequality, which correlates highly with the levels of unemployment. Moreover, inequalities exist in multiple forms/sectors: built environment, economy, education and health care facilities and governance. Finally, we note that we cannot focus on one dimension of inequality to the exclusion of others, since each factor is likely to be both a cause and an effect. This has been noted by many researchers, including Doyle and Stiglitz (2014):

> [*H*]ealth inequality is both a cause and consequence of income inequality. Inequalities in education are a primary determinant of inequalities in income and opportunity. In turn, as we have emphasised, when there are distinct social patterns of these multiple inequalities (for example, those associated with race or ethnicity), the consequences for society (including social instability) are increased. (n.p.)

■ Urban planning policies

Across the globe, national governments use urban planning as a framework to transform visions into realities (Urban Times 2013). Urban planning policy is critical for reasserting urban space and territoriality, and also for providing direction and a course of action for urban development (United Nations Habitat III 2017). It especially provides an overarching integrated framework to tackle pressing urban challenges, including slum prevention and regularisation, access to land, urban mobility, basic services and infrastructure.

This section reviews urban planning policies of the six targeted countries: South Africa, Tanzania, Rwanda, India, Bangladesh and the Philippines. It adopts a comparative approach to summarise the major planning policy elements across the countries. Table 2.4 summarises the urban planning elements across the countries and highlights the planning strategies and systems, context, planning time scale and responsible bodies in each country.

■ Planning context and colonialism

Urban informality forms a major challenge within which planning policies in Asia and Africa are formulated. Spatial planning aims to address the ills of rapid urbanisation (fuelled largely by rural–urban migration), including controlling rising informal settlements, poverty and spatial fragmentation (Baffoe 2020). In the Philippines, for instance, urban planning proffers solutions to protect and enhance the rights of all citizens by reducing social, economic and political inequalities (Delos Reyes et al. 2018). In post-apartheid South Africa, planning and development strategies have focused on reducing spatial inequalities through the provision of basic services and infrastructure, job creation, governance and environmental protection (City of Johannesburg 2017). In India, planning aims to invest in large-scale urban infrastructure for sustainable economic growth and poverty reduction (Kundu et al. 2018). Similarly, in Bangladesh, planning

TABLE 2.4: Major urban planning policies across SHLC countries.

Country	Planning strategy	Timeframe	Context	Planning system	National spatial planning policy	National urban planning policy	Planning body
Tanzania	Master plans	Various (5 years, 8 years)	Ujamaa, urbanisation, informality	Decentralised but not autonomous	Strategic urban development (ended master planning era)	None	Ministry of Land, Housing and Human Settlement
Rwanda	Master plans	Unspecified	Genocide, rising informality	Decentralised but not autonomous	Kigali City Master Plan 2013, National Land Use and Master Plan 2011	National Urbanization Policy 2015	Ministry of Infrastructure
South Africa	Transit-oriented development, service delivery	5 years (4 integrated development plans since 2001)	Apartheid, spatial fragmentation, inequalities	Centralised/city level	Integrated development plan, spatial development framework	Integrated urban development framework	Department of Cooperative Governance and Traditional Affairs, city authorities
Bangladesh	Master plans	5-year plans, short-term plans, 20-year plans (long-term plans)	1971 Partition, urbanisation, poverty	Hierarchical multi-sectoral (decentralised but with little autonomy)	National Urban Sector Policy 2011	None	Planning Commission
Philippines	Codes and Acts	Unspecified	Urbanisation, informality, poverty	Hybrid top-down and bottom-up	National framework for physical development	None	Housing and Urban Development Coordinating Council
India	Short-term sector-specific development strategies	5-year Plans	Urbanisation, poverty, informality	Hybrid top-down and bottom-up (shared powers)	Various	National Urban Policy 2018	Ministry of Urban Affairs

Source: Baffoe (2020).

SHLC, sustainable, healthy and learning cities and neighbourhoods.

targets improvement in the living conditions of urban dwellers through physical development, protection of public health, education provision and poverty reduction (Roy et al. 2018). Likewise, in Tanzania and Rwanda, planning focuses on spatial transformation and regularisation as a strategy to manage informal settlements while boosting economic development. Therefore, across all the countries, rising informal settlements are a major challenge, and there are conscious planning efforts geared towards their eradication.

Meanwhile, a common determinant across all the countries is the influence of former 'colonial masters'. In almost all the countries, these colonial masters (Britain, Germany, Belgium and the Netherlands) dictated physical development, and their legacies have shaped post-colonial planning. For instance, they determined physical planning in Tanzania, Rwanda and South Africa, using land-use zoning and racial and residential segregation to determine what to build and in what place.

◼ Planning approach

Across all the countries in the case study, planning tends to be reactive rather than proactive. Policies are formulated to tackle specific problems (e.g. slum upgrading, road construction and street lighting) without adequate future projections. This explains why spatial planning has achieved little success in these countries. Lack of problem diagnosis and recourse to long-term spatial plans are counter-productive and are non-starters in these countries. In post-colonial countries, for instance, planning aims to redress challenges resulting from the 1994 genocide (Rwanda), the Ujaama 'villagisation' programme that collectivised production (Tanzania) and apartheid (South Africa). The situation is a little different in the Asian countries: deteriorating economies, crime and social justice issues, rising informality, as well as poor infrastructure underscore the need for short-term planning policies in the Philippines, Bangladesh and India.

■ Planning systems and policies

Planning systems and policies differ somewhat among the six countries in the case study. In Tanzania, national guidelines on land management and planning are followed, usually in the form of master plans. Unlike Tanzania, planning in the Philippines is under the remit of national and subnational governments (Delos Reyes et al. 2018). In Rwanda, urban planning is in its infancy – a consequence of the genocide in 1994. However, in planning post-genocide Kigali, the government of Rwanda (unlike those in Tanzania and the Philippines) has embraced urbanisation as a strategy to drive modernisation and economic development (Ministry of Infrastructure 2015). The case in Bangladesh is that of hierarchical multi-sectoral development plans. Here the regulatory frameworks at the national and local levels shape urban planning and development (Roy et al. 2018). In federal India, the power to formulate policies and programmes is shared between the state and the central government. While state governments formulate their own plans, the central government provides the necessary guidelines and advisory services (Kundu et al. 2018). In South Africa, urban planning is mainly the responsibility of municipalities, within the broader context of national government policies.

■ Understanding health and well-being

As articulated in the UN's SDG 11, understanding and addressing urban health inequalities is a basic prerequisite for making cities inclusive, safe, resilient and sustainable. Health is multidimensional and is an outcome that is influenced by a plethora of situations. The health of the individual is directly or indirectly determined by the collective set of circumstances, where they are born, grow up, work and live, also known as the social determinants of health (Marmot 2005). With rapid urbanisation (mostly in developing countries), inequalities in health outcomes are becoming even more pronounced. Urban health is a complex issue that is shaped

by both multi-sectoral and multilevel determinants, which are mostly evident in proximal neighbourhoods (Harpham 2009). This complexity is the result of a range of environmental (both social and physical) and service factors that come into play in urban areas. In rapidly urbanising areas, these determinants are either not properly in place or are in their preliminary stages, hence not providing protective benefits (Wang et al. 2018).

◾ Urban neighbourhood and health

Cummins et al. (2007:1835) argue that there exists a 'mutually reinforcing and reciprocal relationship between people and place'. Although the variation in the health and well-being of the people is mostly explained by individual characteristics, a significant contribution is made by contextual factors connected to the nature of the physical and natural environment (Pickett & Pearl 2001). Apart from the individual compositional factors (demographic, behavioural and psycho-social), contextual factors (such as social, physical and institutional environments) also determine the health outcomes of people (Bhandari et al. 2017). These factors not only make direct contributions, but the health of places is also the result of the interaction of people with their wider environment (Cummins et al. 2007).

A growing body of research highlights the close association between health and urbanisation (Aliyu & Amadu 2017; Hou et al. 2019; Leon 2008). The direction of this association is skewed, however, suggesting both negative and positive consequences of urbanisation on individual health and well-being. When urbanisation is planned, it tends to produce health benefits, while negative outcomes are highly likely when the city sprawls without a plan (Aliyu & Amadu 2017).

Evidence from low and middle-income countries suggests that most of their cities are hubs of economic growth and have helped lift millions out of poverty (Zhang 2016). Better economic status often leads to better health, which indicates that there are

health benefits in the move towards urbanisation in developing countries. However, not all sections of their populations benefit, and while cities in Africa and Asia are in the lead as regards rapid urbanisation, many are also far behind (compared to more developed countries) in devising strategies to address the high level of inequalities in population health and its wider determinants (Cobbinah, Erdiaw-Kwasie & Amoateng 2015).

■ Policy landscape shaping health and well-being

Governments increasingly recognise health as a key aspect in their development policies. Reports from Bangladesh have highlighted the fact that their constitution acknowledges 'adequate health care' as the basic right of every citizen. Reports from each country are mostly focused on exploring the role of policies in delivering health care services in urban areas. The role of global initiatives such as the Alma Ata Declaration on primary health care of 1978; the Bamako Initiative of 1988 concerning drug pricing; the Millennium Development Goals 4, 5 and 6 and, most recently, the SDGs (United Nations General Assembly 2015) are crucial in shaping the health policies of cities. Over and above these global initiatives are the national policies of each country.

Table 2.5 summarises the existing health policies that guide health care delivery in each of the countries in our study. It should, however, be noted that health care delivery is not the same thing as individual or even population health. As highlighted in the previous section, individual and population health is an outcome of the continuous interaction of multiple determinants, of which health care is only one.

■ Financing mechanisms

The total expenditure on health as a percentage of GDP traverses a wide range in our case study countries, as compared to China and the United Kingdom. Not all country reports were explicit about the situation around health financing.

TABLE 2.5: Current policies that shape health care delivery.

Country	National policy	Urban health policies (if any)
Bangladesh	• National Health Policy 2011	Urban Sector Policy (draft) 2014
India	• National Health Policy 2017	National Urban Health Mission 2013, which was later merged with national rural health mission 2005 to launch the National Health Mission 2013
Philippines	• The Local Government Code of 1991 • The Philippine Health Agenda for 2016–2022	None
Rwanda	• Health Sector Policy 2005 • National Community Health Policy 2008 • Fourth Health Sector Strategic Plan 2018–2024	National Urbanisation Policy 2015
Tanzania	• The National Health Policy 2017	*Private Hospitals Act* of 1977 *Private Hospitals Regulation (Amendment) Act* of 1991
South Africa	• *National Health Act* 2003	None

The percentage of national budget allocated to health also varies between the countries. The Philippines has the lowest proportion (3%) compared to almost 19% in Rwanda. Tanzania and Rwanda (currently at 10%) have indicated their countries' commitment to the 2001 Abuja Declaration, where African Union members agreed to raise their health budget to a minimum of 15% of each nation's national budget. In India and South Africa, two levels of government (centre and state) allocate a certain share of their own budget to health care. When the financing is put in the context of the share of the total GDP of the country, South Africa leads the league with over 8%, followed by Rwanda and Bangladesh is at the bottom (see Figure 2.2).

Over and above the financing government provides, much of the burden of health cost is borne by individuals themselves. In most of the case study cities, private for-profit institutions are the most common form of health service providers. The private sector mostly relies on out-of-pocket expenditure, and currently
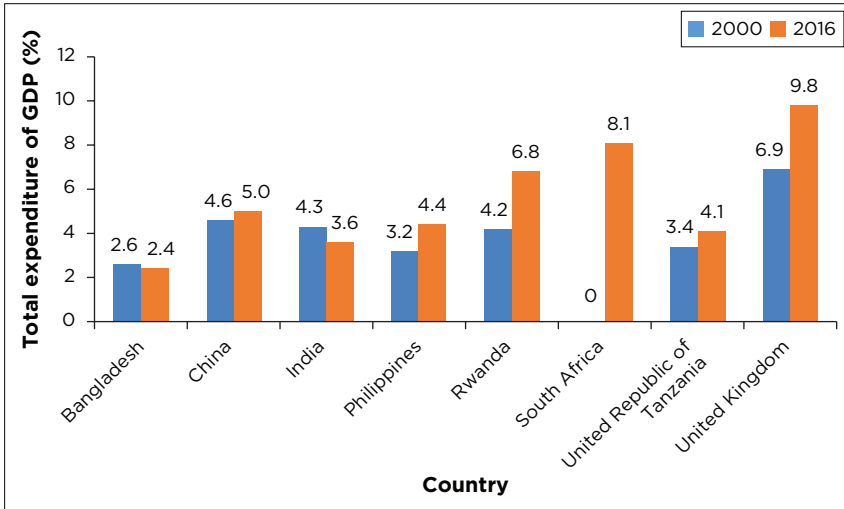
Source: WHO (2019).
GDP, gross domestic product.
FIGURE 2.2: Trend of total expenditure on health as a percentage of GDP.

this form of expenditure is significantly high in Bangladesh, India and the Philippines (see Figure 2.3). This form of financing is widely acknowledged as being a reason for increased health inequality/inequity in the cities.

■ Service landscape

In all the case study countries, national policies define and guide the provision of health care services in urban areas. Due to the different models of governance, responsibility for the provision of health care services differs between the countries. In some countries, such as Rwanda, most urban citizens are served by public health facilities, while in most other countries private facilities are mostly the first (and only) point of contact. However, it is evident that there is a multiplicity of service providers in all case study countries, with the private sector mostly concentrated in the cities.
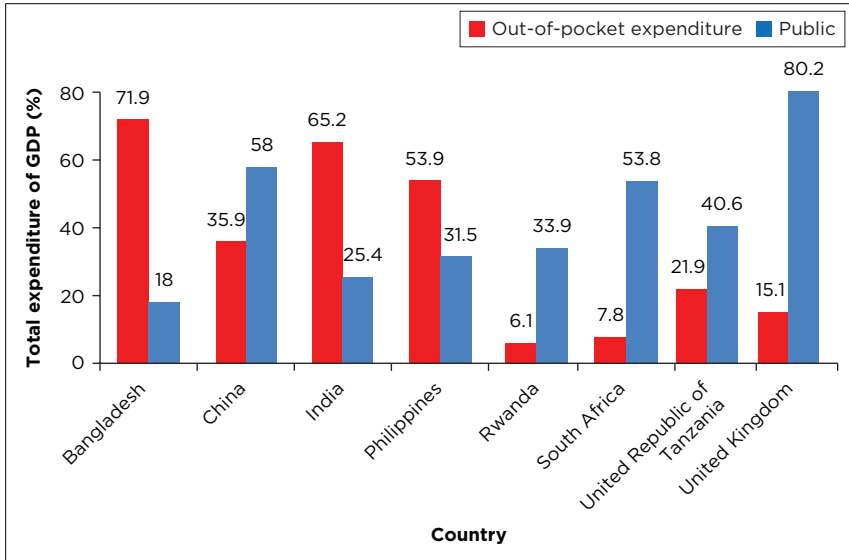
Source: WHO (2019).

FIGURE 2.3: Major forms of health expenditure.

As mentioned earlier, governments are increasingly recognising health as a key aspect of development policies. In the meantime, urban health is also entering the policy debate. The provision of private health care may have added the number of service providers and improved access to the services, but its socio-economic consequences are to be explored. The common observation is that the private sectors are either unregulated or are inadequately regulated.

Cities in developing countries are going through a rapid transition in health provision. The transition is taking place both in health problems (shift from infectious/communicable disease to a bigger burden of non-communicable diseases) and the health system as a whole (Elsey et al. 2019). Health-related data that address and represent these changing trends could be useful in guiding the next level of research. However, some of the key issues that need investigation are changing health care needs

(epidemiological transition) and environmental attributes (both built and natural).

■ Learning cities

The concept of 'learning cities' is a relatively recent addition to the international development agenda, albeit a concept with a long history, particularly in the Global North. The UNESCO Institute for Lifelong Learning (UIL) has in recent times taken a lead in using the concept of learning cities as a vehicle for promoting lifelong learning. UIL (2015a:9) defines a learning city as one that effectively mobilises its resources in every sector to:

- promote inclusive learning from basic to higher education
- revitalise learning in families and communities
- facilitate learning for and in the workplace
- extend the use of modern learning technologies
- enhance quality and excellence in learning
- foster a culture of learning throughout life.

UNESCO claims that learning cities offer numerous benefits, from the promotion of '[i]ndividual empowerment and social cohesion' to '[e]conomic development and cultural prosperity' and, perhaps most broadly, '[s]ustainable development' (UIL 2015a:10; also see 10–13).

UNESCO has also sought to incorporate the concept of learning cities into the SDG agenda, tying the concept to a more comprehensive list of development objectives, and stressing the central role that lifelong learning within families, communities, towns and cities can play in their realisation (UIL 2017). China is a clear leader in using the learning cities concept as a driver for policy and practice in its cities. Beijing conducted the first of UNESCO's International Learning Cities conferences in 2013, and its Municipal Office of the Leading Group for the Efforts of Building a Learning City in Beijing has formulated a number of mechanisms to evaluate the performance of the learning system (including enterprises, villages and government agencies) at the district and sub-district level.

Despite such efforts, there are at least three clear obstacles to incorporating learning cities into the sustainable development agenda in the Global South. The first centres on education outcomes (see Nesterova & Young 2020:32, 35–36). As illustrated in Table 2.6, four general trends can be identified from across the seven case study countries: improved enrolment in primary and secondary education, higher completion rates, improved literacy and greater gender equity. School enrolment is expressed in net rather than gross percentage, and gender equity is expressed in gross primary rates.

TABLE 2.6: Education outcomes by country.

Country	Enrolment	Completion	Literacy	Gender equity
Bangladesh	Primary: 51.6% (1970) – 91% (2017) Secondary: 16.5% (1976) – 63.7% (2017)	Primary: 44.6% (1976) – 67.8% (2010)	29.2% (1981) – 73.9% (2018)	0.49 (1970) – 1.07 (2018)
China	Primary: 92.8% (1987) – 89% (1997)	Primary: 100.4% (1989) – 98.3% (2009)	65.5% (1981) – 96.8% (2018)	0.73 (1974) – 1.01 (2018)
India	Primary: 61% (1971) – 92% (2013) Secondary: 61.6% (2013)	Primary: 39.5% (1971) – 94.3% (2017)	40.8% (1981) – 74.3% (2018)	0.64 (1971) – 1.15 (2017)
Philippines	Primary: 96.8% (1976) – 94% (2017) Secondary: 46.2% (1972) – 65.6% (2015)	Primary: 85.8% (1981) – 108.6% (2017)	83.3% (1980) –98.2% (2015)	1.07 (1976) – 0.96 (2017)
Rwanda	Primary: 55.1% (1973) – 95% (2018) Secondary: 35.9% (2018)	Primary: 21% (1971) – 86.5% (2018)	38.2% (1978) – 73.2% (2018)	0.77 (1971) – 0.99 (2018)
South Africa	Primary: 67.7% (1973) – 87% (2017) Secondary: 51.2% (1994) – 71.9% (2017)	Primary: 77.1% (1991) – 87.3% (2016)	76.2% (1980) – 87% (2017)	0.99 (1970) – 0.97 (2017)
Tanzania	Primary: 70.3% (1980) – 81.3% (2018) Secondary: 24% (2016) – 26.5% (2018)	Primary: 20% (1971) – 68.7% (2018)	59.1% (1988) – 77.9% (2015)	0.66 (1970) – 1.03 (2018)

Source: World Bank (n.d.); a similar table is presented in Nesterova and Young (2020:35–36).

There are, however, notable exceptions in the trend towards improved enrolment in primary and secondary education, and improvement is not linear. Primary enrolment in Tanzania increased dramatically from 49.4% in 1998 to 96.7% in 2006 before falling to 81.3% in 2018. Rwanda and the Philippines have also regressed from 2014 and 2016 respectively, though less dramatically than Tanzania. Major disparities also exist: the Philippines's primary completion rate of 108.6% in 2009 far outpaces Tanzania's of 68.7% in 2018; China's literacy rate of 96.8% in 2018 considerably exceeds Rwanda's of 73.2% in the same year and gender equity in primary education is inconsistent, with a slight overrepresentation of students who are men in South Africa and a stronger presence of students who are women in India. India and Bangladesh have similar figures for enrolment, literacy and gender equity, but diverge sharply in primary completion rates at 94.3% in 2017 and 67.8% in 2010, respectively. Financial commitments are similarly uncertain, as several countries have experienced notable reductions in total government expenditure on education as a percentage of GDP, including Rwanda, from 5.7% in 2001 to 3.1% in 2018; Tanzania, from 4.5% in 2010 to 3.4% in 2014 and India, from 4.4% in 1999 to 3.8% in 2013 (all data in the paragraph from World Bank 2018). Such trends do not suggest progress towards a point at which resources across all sectors are mobilised to offer foundation-level skills and knowledge that would provide the basis for a learning society based on lifelong learning.

The second obstacle to incorporating learning cities into the sustainable development agenda in the Global South is that data at the city and (particularly) neighbourhood level remain difficult to come by (Nesterova & Young 2020:38). This is an obvious impediment to an understanding of the role of lifelong learning in sustainable cities and neighbourhoods; our capacity to move beyond rhetoric towards systematic methods customised to local priorities and measuring progress against indicators that would determine whether a learning city is a reality. Indicators and

measurement tools do exist but need refinement (see Lido et al. 2016; Lido, Reid & Osborne 2019; Osborne & Hernandez 2020) and cultural contextualisation. Yet, the lack of reliable data remains more problematic. In the context of China, a report on efforts to create a more operable learning city index in Chinese cities is illustrative (UIL 2015b).

The third obstacle is that important questions remain around the role of institutions in the promotion of learning cities. According to UNESCO, '[s]trong political will and commitment', '[g]overnance and the participation of all stakeholders' and the '[m]obilization and utilization of resources' are all crucial (UIL 2015a:11). The UNESCO Global Network for Learning Cities has published a set of guidelines for building learning cities focusing on devising a plan, creating 'coordinated structure[s] involving all stakeholders', using 'celebratory events' to launch and support the process, ensuring accessibility, implementing monitoring and evaluation and securing funding sustainability (UIL 2015c:1).

The extent to which such descriptions match the realities of urbanisation in the Global South, and the attendant challenges that these processes present, is uncertain. Inclusive governance, high levels of equality, technocratic efficiency and financial stability are not universal, suggesting that lifelong learning at the city level will be pursued in dramatically different institutional environments defined by diverging social, economic, political, organisational, legal and historical realities – if, indeed, it is pursued at all.

■ Conclusion and recommendations

McGhie (2019), among others, refers to the declaration by the UN in 2015 on 'Transforming our world: The 2030 Agenda for Sustainable Development', and emphasises that sustainable development 'recognises that eradicating poverty in all its forms and dimensions, combating inequality within and among

countries, preserving the planet, creating inclusive and sustainable economic growth, and fostering social inclusion' are all interdependent (United Nations General Assembly 2015:n.p.). Urbanisation can help drive sustainable development. However, within cities, poverty and inequality are at their most acute and, in lower- and middle-income countries, rapid growth due in part to rural-urban migration poses challenges of global proportions. Responding to urbanisation requires an understanding of the 'complex relations between sustainable cities, education and health at the level of neighbourhoods. Sustainable cities depend to a considerable extent on a population with the resilience and resources that health brings, and on relevant learning' (Wang & Kintrea 2019). Equally, access to health care and quality education depend on the sustainable development of cities and the neighbourhoods within them.

Part 2
Globalisation: Impacts and responses

The role of local economic development agencies and non-profit organisations in local economic development: South African case studies[4]

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◼ Abstract

In this chapter, Local Economic Development Agencies (LEDAs) and Non-Profit Organisations (NPOs) are discussed as important role players to help mobilise and stimulate Local Economic Development (LED). These entities are generally established to assist communities and areas that have attractive natural assets, or in respect of places with high tourism potential. The case studies indicate that the aims of these entities are to generate real and sustainable employment or business opportunities in low-income rural or regional areas.

According to Puljiz, the functionality of LED is viewed as a mechanism of catalytic local management. In this chapter, two case studies are examined in order to determine the extent to which LED can be successfully implemented. Findings from the case studies indicate that issues such as a lack of understanding or awareness of the role of LEDAs and inadequate communication channels between stakeholders such as farmers, district municipalities, business communities and officials, still impede development. The case studies further highlight the fact that a lack of trust, local tensions, a lack of industry regulation and constant changes in LEDA personnel are also inhibiting factors in regard to the work of LEDAs and NPOs. The main conclusions from the case studies however indicate that strong communication

links and LEDA support, do promote access to markets, training and mentoring for empowering individuals, and in certain instances facets of service to the community are improved. The most important contributions of LEDAs and NPOs are the creation of positive partnerships that could lead to an increase in productivity with sustainable outcomes.

■ Introduction

> Local economic development (LED) is a participatory development process that encourages partnership arrangements between the private and public stakeholders of a defined territory, typically gathered in forums that enable the joint design and implementation of a common development strategy by making use of the local resources and competitive advantage, with the final objective of stimulating economic activity and creating decent jobs for all. (ILO 2012:2)

Helmsing (2001) suggests that LED requires collaboration between municipalities, NPOs and business in order to control current resources, generate employment and stimulate the economy of a province. It stresses local influence, using the abilities of local manpower, institutional and physical resources. Local Economic Development initiatives mobilise actors, organisations and resources, in order to develop new businesses and local systems through discussion and strategic measures.

The Bureau for Economic Growth, Agriculture and Trade and Urban Institute (2003:2) describes the three elements in the term LED as follows:

- 'Local refers to a process of valuing the endogenous potential, making optimal use of the already existing local capacities.
- Economic is directed towards the identification of investment opportunities, supporting entrepreneurial activities and facilitating the access to (new) markets.
- Development is the process that is aimed at promoting an improvement in the living and working conditions of the community through the creation of new jobs, the retention of existing jobs and the generation of income'.

Birkhölzer (2009:4) compares four scenarios of LED: 'development from above', in which the government is the main contributor that makes decisions and instructions that are passed down to local stakeholders; 'development from outside', that relies on external investors to bring in money and other resources required for development; a 'wait-and-see approach to development', in which home-grown businesses stay more or less unreceptive, waiting for development to happen to them and lastly 'development from within' in which local stakeholders play the key role:

> And here we are at the heart of Local Economic Development: It starts when people realize that neither the government nor the market economy serve their needs or solve their problems, and if they are unwilling or unable to leave their homes. In this situation people embark (usually after a period of not successful protesting or campaigning) on strategies of economic self-help which often lead to the foundation of new types of (social) enterprises. (p. 4)

The South African government recognises the challenges facing municipalities in terms of service delivery, particularly in the context of a growing population, the legacy of inequitable infrastructure development and a backlog in municipal infrastructure and service. As one of the interventions to address these challenges, the government has made provision for Public–Private Partnerships (PPPs) and other municipal service partnerships in the *Municipal Systems Act 32* of 2000 and *Municipal Finance Management Act* 56 of 2003 and other guidelines.

The formations of PPPs are important mechanisms to promote LED (Venter 2019):

> A PPP is a contract between a municipality and a private party in which the private party assumes substantial financial, technical and operational risk in the design, financing, building and operation of a project. There are two types of PPPs: where the private party performs a municipal function, and where the private party acquires the use of municipal property for its own commercial purposes (Municipal Service Delivery and PPP Guidelines Module 1: Regulations n.d.:6). 'Despite the evident benefits of PPPs to local development,

nationally few small-scale PPP initiatives have been implemented at municipal level'. (p. 214)

The World Bank (2014:4) identifies complicated and problematic challenges that face large-scale PPPs that include issues relating to government processes and procedures, high transaction charges, lack of public and private sector ability, limitations in funding because of the risk profile of ventures as well as the credit profile of the subnational entities sponsoring these projects. Even small-scale PPP projects may experience some of these challenges, although common constraints are experienced by all PPPs.

Akintoye, Beck and Hardcastle (2003) and Ruuska and Teigland (2009) argue that PPPs encounter significant challenges in accomplishing mutual understanding. Research has revealed that team colleagues from different groups have fundamental differences in their behaviours, values and attitudes. Not only do different groups view different sets of data as of importance, but they even recognise the same information in a different way. As a result, such groups tend to not have a common social experience and fail to develop a common perspective.

In this chapter, two case studies are examined in order to decide the magnitude to which LED was successfully implemented. In both cases, the participation of and collaboration with local actors was central to the LED approach:

- **Case Study 1:** Umhlosinga Development Agency, as an example of a Local Development Agency (LEDA).
- **Case Study 2:** Siyavuna Development Centre, as an example of the contribution of an NPO to LED.

The case studies have been selected, firstly, because they are located in the most underdeveloped regions of KwaZulu-Natal where levels of unemployment and poverty are amongst the highest in South Africa, and secondly because these case studies demonstrate two different approaches to stimulate LED, namely through LEDAs and NPOs.

■ The South African Local Economic Development context

■ The local government's mandate for Local Economic Development

The mandate of the local government in terms of LED is stipulated in three key documents:

- Sections 152 (c) and Section 153 (a) of the Constitution of South Africa: Local government must 'promote social and economic development' and 'structure and manage its administration, and budgeting and planning processes to give priority to the basic needs of the community, and to promote the social and economic development of the community'.
- The 1998 White Paper on Local Government (Republic of South Africa 1998:s. B, para. 1.1): 'Local government is not directly responsible for creating jobs. Rather, it is responsible for taking active steps to ensure that the overall economic and social conditions of the locality are conducive to the creation of employment opportunities'.
- The *Local Government Municipal Systems Act 32* of 2000 (Section 26): Municipalities must develop an Integrated Development Plan that must include 'its local economic development aims' as an integral part of the 'comprehensive plan for the development of the municipal area'.

■ Definition of Local Economic Development for South Africa

The Department of Cooperative Governance (DCoG) defines LED as (Department of Cooperative Governance and Traditional Affairs n.d.b):

> [*A*]n adaptive and responsive process by which government, public sector entities, citizens, business and non-governmental sector partners work collectively to create better conditions for innovation-

driven inclusive economic development that is characterised by knowledge transfer and competence building; employment generation; capacity development; investment attraction and retention; image enhancement and revenue generation in a local area in order to improve its economic future and the quality of life for all. (p. 4)

■ Key role players in Local Economic Development

Although the Constitution of South Africa, the White Paper on Local Government and the *Local Government Municipal Systems Act* mandate local governments to promote economic development, Enwereji and Uwizeyimana (2019) highlight the fact that nearly all local municipalities do not have sufficient economic growth policies in place and are unable to tackle poverty and unemployment. According to Meyer (2014), LED can only be effective with a comprehensible planning process including all stakeholders within the local area.

Venter (2019) describes LED as:

[*A*] complex process which requires the active involvement of a wide variety of stakeholders. In order to bring these stakeholders together in a meaningful and an effective way, it is important to have a clear concept of the different actors and their roles in such a process. Many actors and stakeholders must be engaged in the economic development mission in order to accomplish meaningful economic development. (p. 27)

Khambule (2018b) supports the view that:

Despite the interdependence of the levels of government, it is local institutions that have the greatest role to play in addressing the triple challenges (of unemployment, poverty and inequality), because of their close proximity to the citizens and developmental challenges South Africa is facing…. The failure of local government to effectively generate socio-economic improvements in the lives of South Africans meant that there was a need to reform the relationships between municipalities and local economies. (pp. 288, 297)

Venter (2019) includes LEDAs and NPOs as key role players in LED because the LED directorates in municipalities generally consist of a small team that is supported by technical experts. Therefore, the directorates rely on partnerships to fulfil their mandates and play a coordinating role in the implementation of the LED strategy, for example, other government departments and LEDAs that have responsibilities for LED. According to Venter (2019) local NPOs and civil society are important actors and partners for LED for strengthening communities:

> Most have a very good knowledge of the locality and issues, and are well connected in the community … They can assist communities in organising themselves, in defining and articulating their interests and needs towards other LED actors, and in pursuing and implementing LED proposals and initiatives. (p. 30)

■ Internal or external mechanism for Local Economic Development

Local Economic Development Agencies in South Africa are regulated by the *Municipal Systems Act 32* of 2000 and the *Municipal Finance Management Act 56* of 2003. Section 79 of the *Municipal Systems Act* makes provision for a municipality to deliver LED through an internal mechanism, namely, the establishment of an LED directorate in the bounds of the municipality's management and under the control of the council. Section 80 of the Act enables municipalities to perform LED services through a service delivery agreement with an external mechanism, for example, through another municipality or public entity, or through a community-based organisation (CBO), NPO or a private-sector entity. Section 80 allows for LEDAs to embark on a variety of services on behalf of the municipality (Venter 2019):

> If the municipality decided on the external mechanism, it would conclude a service delivery agreement with the selected entity. The municipality must exercise its discretion to select the internal or external mechanisms that are most appropriate for delivering

specific services, for example for creating sustainable LED. During the consideration of the mechanisms, the municipality must consider the urgency of the matter, the importance of the service, the scale of expenditure, the level of risk, and the potential for uncertainty it will create in the community and on labour. ... In terms of Section 81 of the Act, the municipality remains responsible for ensuring that such a service is provided to the local community. (p. 267)

■ The role of Local Economic Development and Local Economic Development Agencies in the developmental state

The South African government (Department of Cooperative Governance and Traditional Affairs 2009) recognises that local government:

> [/]s a key part of the reconstruction and development effort in our country. The aims of democratizing our society and growing our economy inclusively can only be realized through a responsive, accountable, effective and efficient local government system that is part of a developmental state ... Developmental local government is central to building the developmental state. (p. 3)

Venter (2019:9) describes this as an important shift from the conventional approach to the role of local government as the delivery of basic services with regard to local government as an involved representative of local development and local governance within a broader developmental authority.

The developmental state is central to the government's strategic planning (National Development Plan [NDP] 2030:17) and sees the role of the developmental state as building 'the capabilities of people to improve their own lives, while intervening to correct historical inequalities. Neither government nor the market can develop the necessary capabilities on their own' (NDP 2030):

> A developmental state tackles the root causes of poverty and inequality. A South African developmental state will intervene to support and guide development so that benefits accrue across society (especially to the poor), and build consensus so that long-term national interest trumps short-term, sectional concerns. A developmental state needs to be capable, but a capable state does not materialise by decree, nor can it be legislated or waved into existence by declarations. It has to be built, brick by brick, institution by institution, and sustained and rejuvenated over time. It requires leadership, sound policies, skilled managers and workers, clear lines of accountability, appropriate systems, and consistent and fair application of rules. (p. 44)

Khambule (2018:298–301) positions LEDAs as key role players in the developmental state as subnational institutions and dedicated planning structures that are used as interventionist mechanisms to create capable local governments that will support South Africa's aspirations of becoming a capable developmental state. Khambule (2018:287) explains the important role of LEDAs that 'have emerged as appropriate institutional structures for advancing socio-economic development in the local government-led development landscape, because of the inability of local municipalities to lead local economic development'.

Khambule (2018:299–301) describes four roles for LEDAs in a local development state: improving capacity and ensuring that local government is capable of driving economic development; coordinating development planning and democratic development; the integration of different stakeholders with different capacities in a bid to strengthen institutional arrangements for LED as 'developmental states' (see Khambule 2020) depends on the reciprocal recognition and strong 'interface' between the four actors: bureaucracy, businesses, society and the state and promoting 'social capital' to enable an efficient LEDA that is managed through local ownership (cf. Khambule 2018:97–117).

■ The role of Local Economic Development Agencies and non-profit organisations in the national framework for Local Economic Development

The DCoG is the custodian and lead government department responsible for LED, and for developing the National Framework for LED (NFLED). The NFLED (2017–2022) describes the important roles of LEDAs and NPOs in LED.

☐ The role of non-profit organisations in Local Economic Development

The NFLED (2017:74) recognises the critical roles of non-governmental organisations (NGOs) and CBOs in the implementation of the Framework, 'especially those provided by private sector membership bodies such as Chambers of Commerce, but also a broader range of NGOs and CBOs that work to mobilise local efforts'.

The NFLED (2017:70) describes the specific contribution of NGOs to LED on provincial level in the following areas:

- shaping and implementation of participatory democracy
- provision of poverty reduction mechanisms
- research and knowledge management
- support innovation and entrepreneurship
- LED planning support
- resource mobilisation.

Conventionally, the most widely recognised sectors involved in LED (besides municipalities) are LEDAs and the private sector. However, literature reviewed indicates that the NPO sector acts as a third sector in LED. Nissan, Castano and Carrasco (2010) argue that the existence of the NPO sector is ultimately a reflection of a government's failure to serve the entire society.

Those whose needs are not satisfied by government tend to demand public goods and services from NPOs (Young 2006).

Government's failure is greater where there is a very large population, but also where the population is sparse and the provision of public goods and services are inadequate. Non-Profit Organisations tend to largely serve less profitable consumers (Nissan et al. 2010).

The classical economic theory states that when the market fails, government intervenes (Balser & McClusky 2005), but if governments also fail, the 'third sector' intervenes. Non-Profit Organisations thus act as 'failure correcting devices' (Nissan et al. 2010). The market failure and the government failure theories argue that NPOs can effectively provide public goods and services with private financing in economies where the market and the public sector have already had distinctive roles (Shaffer, Deller & Marcouiller 2004). The significant roles of NPOs are prominent where there is market failure and government failure and where there is an existing partnership between the government and NPOs. Balser and McClusky (2005) argue that NPOs are the third sector and can play an important role in providing technical support and services to 'impoverished households' and 'community-based organizations' (these latter 'constituencies are often not reached by conventional service providers from the private and public sectors' (Anheier & Salamon 2014).

The NPO sector can be divided into different categories such as educational, charitable or religious NPOs. The spectrum of services offered by civil society organisations encompass a diverse mix, including information, technical and organisational skills training, strategic planning, facilitation of access to resources, support for lobbying and networking activities (Gordon & Dreman 2007). Civil society organisations represent an important reservoir of knowledge on how best to forge development partnerships with the limited resources they possess.

☐ The role of Local Economic Development Agencies in Local Economic Development

The NFLED (2017) describes LEDAs as: 'a popular local and international governance model for economic development facilitation ... as special-purpose vehicles to promote LED and implementation'. The effectiveness of LEDAs should be improved, *inter alia* through being (NFLED 2017):

> [*F*]ormally acknowledged as implementing partners for government-wide economic development and local development implementation at municipal level ... should be sought out as implementing partners in small towns, mining areas, cities and economic zones. (p. 52)

The typical roles fulfilled by most LEDAs include the following (NFLED 2017:52):

1. enhancing sustainable LED strategies in an area
2. mobilisation of funding and executing high-impact projects
3. encouraging competition amongst businesses
4. providing assistance with LED especially enabling municipalities to include the feeblest and most susceptible economic sectors
5. ensuring networking, partnerships and cooperation across various economic sectors.

Local Economic Development Agencies are fast becoming the most frequently used developmental instrument in South Africa and other developing countries. In many international states LEDAs have proven to bring great developmental and rehabilitation advantages in post-war times – hence their popularity and adoption in so many countries. As indicated in the literature LEDAs are still insufficiently understood in South Africa (Mthimkhulu 2015). Puljiz (2003:32) defines LEDAs as 'structures which are based on the bottom-up approach, that came into being as a response to the incapacity of central or national government in addressing socio-economic challenges of underdeveloped regions'. In South Africa specifically, LEDAs have a strong focus on the implementation of catalytic projects that will promote economic development and attract investment.

■ Case study 1: The Umhlosinga Development Agency

The Umhlosinga Development Agency Pty (Ltd) (Umhlosinga) is a LEDA. Umhlosinga is active in the uMkhanyakude District situated in the rural, far-northern KwaZulu-Natal province of South Africa. It is a municipal entity dedicated to the planning and implementation of a programme of sustainable economic growth and development. The main aim of this case study is to examine the effectiveness of Umhlosinga as a mechanism for LED. In this case study, the importance of the communication channels between the LED agency, its parent – the district municipality and the business community is explored.

The vision of Umhlosinga (see Umhlosinga Development Agency Vision 2021) was; 'to develop an all-encompassing, flourishing district economy that clearly helps all the people of the uMkhanyakude District Municipality. Its mission was to coordinate, plan and administer the realization of a locally operated programme to fast-track the advancement of the local economy of the uMkhanyakude District. The main objective of the development agency was to act as an instrument for and on behalf of the municipality for the purposes of executing economic, social and environmental policies and projects, as recognised by or decided with the uMkhanyakude district and local municipalities'. The agency had wide-ranging roles that, according to Nene (2015:31), included:

- to foster local action to promote economic growth of the local economy
- to enable public and private investment in the local economy
- to promote inclusive participation in the local economy; in order to reverse economic and social exclusion
- to coordinate the realisation of a wholistic sustainable approach to development
- to provide the district with a 'one-stop' shop and knowledge hub for investment opportunities in the local economy

- to acquire assets in the form of land and buildings for social and economic development
- to conduct research that may be necessary to further its goals
- to receive income from various sources to run the agency.

Between 2006 and 2018, LEDAs in South Africa were characterised by poor outcomes with few achievements. The chain of communication and the quality of partnerships between stakeholders still remain very weak, and there were no effective regulations to govern the partnerships. Projects planned by Umhlosinga have not yet materialised, nor have any agreements been signed between the different stakeholders.

Like other LEDAs, Umhlosinga should promote a partnership of the three spheres of government, the business community, statutory bodies and communities in managing the local economy. The Umhlosinga Development Agency Report (2018/2019) confirms this by stating that the creation of partnerships is essential for encouraging investments into the district, thereby highlighting the importance of PPPs in the uMkhanyakude District.

However, respondents interviewed indicated that Umhlosinga faced firstly a shortage of funding for investment and secondly, key positions to operate the LEDA were left vacant. The funding shortages materialised following the national and provincial elections. Budgets were reviewed and reprioritised, which resulted in Umhlosinga's budget being moved to the bottom of the list (Umhlosinga Development Agency 2017/2018). An example as stated in the mid-term report of Umhlosinga was that a specific government department had resolved to allocate a budget of R30 million for the development of the Mkuze airport which never materialised. This development would have increased the tourism and agricultural produce export potential of the area. However Nene (2015:63) did establish that one of Umhlosinga's projects produced employment for 800 people, so the agency did have some successes.

Data gathered from Umhlosinga during a 2017 survey identified the following key issues as impacting positively on Umhlosinga's success (see Umhlosinga Development Agency Vision 2021):

- a clear LED mandate for the region
- maintaining an unbiased and apolitical approach as a development body
- observable project roll-out that creates trust in the LEDA from the communities who see and experience the actual transformation through economic and development plans
- LEDA acting as a bridge between the private and public sectors to stimulate investment and build a more appropriate investor situation.

Despite the successes, the 2017 survey identified the following challenges faced by Umhlosinga:

- financial insecurity and sustainability as funding is reliant on the district municipality
- lack of engagement with all sectors of the private sector
- staff vacancies and human capital retention emanating from the financial uncertainty
- political inference from local government in terms of project focus.

One of Umhlosinga's LED projects was the Mjindi Farming Project that illustrates the challenges faced by many LEDAs. The project's aim was to develop and sustain the agricultural potential of the Jozini region by providing effective farmer support services and maximising agribusiness development in partnership with other stakeholders. Unfortunately, the business community discovered serious corruption and fraud in the Mjindi Farming Project. A forensic report, commissioned by a former agriculture Member of the Executive Committee discovered a series of suspected misuse of provincial government funds on the project. For example, the report revealed that seed potatoes were ordered for the project at a cost of R45 million, but goods to the value of only R9.3 million were actually delivered; R1.9 million was paid for cabbage seeds, but only R927 worth of seeds was accounted for and R1.95 million was spent on onion seeds, but only R1.5 million

worth could be accounted for. Also, irrigation pipelines worth R11.9 million were bought, but R4.4 million worth of those pipelines were found to be inappropriate for use. Such dishonesty and swindling led to the failure of the Mjindi Farming Project (Sunday Times 2018).

The challenges experienced by Umhlosinga are not unique. Another study of five LEDAs in three provinces in South Africa (including Umhlosinga) identified the following challenges that negatively disrupt effective outcomes of the LEDAs (Nene 2015:48–49):

- There is a lack of engagement with the private sector, in particular with the chambers of commerce and industry in the provinces in which they are run.
- Political meddling in the operating and management of LEDAs and frictions within the municipality as to where the objectives lie which impedes the effectiveness of LEDAs.
- There is absence of trust and leadership autonomy for LEDAs outside the realm of municipal policy and procedure.
- Some LEDAs experience a shortage of staff, frequent changes in CEOs and resource limitations within LEDAs.
- Financial insecurity and feasibility of LEDAs leads to staff insecurity about their future and incomes that influences personal retention.
- The huge territory region that the LEDAs have to cover reduces the effectiveness of project implementation across the district.
- LEDAs are hindered by management matters relating to project financing and micro-management by the LEDA's board.
- Red-tape and officialdom from local, district and provincial government departments result in a loss of confidence in the LEDA by the anticipated stakeholders.
- Local government regulations adversely impact on the LEDA projects and their capability to collaborate around economic development priorities; for example, town-planning regulations.

Local Economic Development Agencies also face challenges in achieving the appropriate equilibrium between operative

independence and responsiveness to the need for dynamic strategic leadership and management from their municipality (Nene 2015:56).

Therefore, in conclusion, despite the legal mandate and recognition by national government as well as district and local municipalities, LEDAs encounter many challenges that hamper their potential impact in promoting LED – particularly in the more rural and underdeveloped areas of South Africa. Although a PPP creates opportunities for a LEDA to be innovative, such a partnership can only be effective if potential private and public partners and other role players understand the role of the agency, and are willing to cooperate to ensure the success of PPP projects.

Nene (2015) confirmed that, as is the case with Umhlosinga, the LEDA's have an important responsibility in developing the regions in which they oversee. They are performing well in terms of leveraging government finance and government resources for LED. Although they generally have good interactions with government and other stakeholders, there is still substantial scope for improvement of relationships between these bodies and formal business structures, such as chambers of commerce and industry. In reflecting on Umhlosinga some of the crucial experiences were firstly a greater focus on the communities that the development agency is serving. Secondly, a LEDA should get buy-in from stakeholders, which will enhance the relationships with the municipality and business associations. Lastly, it is important that the outcomes of these relationships benefit the real clients, namely the poor within the community who are/or have been excluded from economic opportunities.

■ Case study 2: The role of non-profit organisations – Siyavuna Development Centre

This case study focusses on the agricultural support NPO, namely Siyavuna, a private entity that was established as a NPO in 2008.

The NPO is working independently towards improving the agricultural sector at Ugu District Municipality in rural southern KwaZulu-Natal province by providing support to rural community farmers. Siyavuna strives to reduce poverty in the Ugu district. where most of the population are living in poverty (Siyavuna Development Centre 2014:1–2).

The case study thus examines the extent of LED in the Ugu District Municipality fostered through agricultural support provided by Siyavuna. According to Isaac Khambule (2018), the 'Siyavuna Smallholder Farmer Development Model aims to enable sustainable rural farming by creating a supportive network amongst rural farmers, focusing on skills development, mentorship and pilot projects'. Siyavuna supports 383 farmers, with more than 2000 farmers having been trained and 426 mentored since the centre's inception.

In the case of the Siyavuna, the NPO works independently towards improving the agricultural sector by providing support to rural community farmers. The centre provides a variety of support initiatives, including financial and technical support and skills development for farmers in the Ugu District. The co-founder of Siyavuna expanded on the purpose of the NPO, explaining that:

> '[/]in the early stage of conceptualisation, the purpose was primarily around economic development – how to drive market access rather than just agricultural production. They assumed that the farmers already knew how to grow and what to plant, but that they did not have access to the market'. (co-founder of Siyavuna, pers. comm., 04 September 2014)

Non-profit organisations operate differently from the for-profit and public sectors. The analysis of Siyavuna shows that the structure of the organisation is aligned with and beneficial to the community it serves. Regarding the operating methods of the organisation, Siyavuna's Director (pers. comm., 03 September 2019) confirmed that there is a commitment between Siyavuna and the community as the community benefits from membership of Siyavuna as well as the initiatives driven by the NPO.

A lack of commitment is one of the elements that results in the failure of most organisations to be effective in providing public services. According to Clark (2006), commitment can be strengthened by signing commitment documents such as contracts, but can also be encouraged by appealing to the community's sense of morality. The most important part of this commitment between Siyavuna and the community (farmers) is that, although it is strict and structured, it is also flexible as farmers are not compelled to sell their produce through the NPO. This commitment serves two goals, one to sustain food security and the other to enhance economic participation of the community.

One of the advantages of NPOs over LEDAs is that it is made up of people from the community, thereby providing NPOs a better understanding of the community. The co-founder of Siyavuna (pers. comm., 04 September 2019) explained that Siyavuna primarily sets up cooperatives that become local market entities and Siyavuna support those cooperatives financially and with capacity. Those cooperatives are largely made up of farmers that the NPO trains in organic agricultural skills. In this way, Siyavuna is working with the cooperatives while also working directly with farmers. The NPO has a team that works with the farmers to develop agricultural skills, share methods and set up farmers support groups. Another part of the NPO's work is mentoring the small businesses, which are the cooperatives, that is, run by the farmers themselves. This is a business-oriented approach aimed at ensuring the maximum return for the farmers.

This confirms Levi's (2005) argument that cooperatives form part of the social economy; therefore, they are compelled to redistribute any surplus income to their members. Siyavuna sets up cooperatives to create local markets for the farmers where they can sell their produce, so these cooperatives become part of the social economy. According to the co-founder (pers. comm., 04 September 2019), Siyavuna provides training in planting as well as mentoring as both are important because of the complex nature of farming.

In conclusion, the Siyavuna's Project Manager (pers. comm., 05 September 2019) stated that Siyavuna's specific role is to create good livelihoods for farmers by using a model that is based on agricultural sustainable community investment. Although the government does provide material needed for agricultural production to the community, the community cannot utilise the materials effectively because they lack knowledge and skills.

■ Conclusion and recommendations

The aim of this chapter was to describe the role of LEDAs and NPOs in kick-starting a local economy. These entities were contextualised in the South African National Framework for LED. Two case studies were described reflecting on the lessons learnt and the strengths and weaknesses of both types of entities.

In terms of the Umhlosinga Development Agency, it is important to recognise the fact that the mandate of LEDAs is to promote economic development in terms of job creation, the development of Small, Medium and Micro Enterprises (SMME) and business expansion and retention.

The economic impact of Umhlosinga will not be visible in the short term as economic development is only achieved over a medium- to long-term period, where results will only be seen in a 10- to 15-year time frame. Partnerships fostered by a LEDA such as Umhlosinga with the business community are important and must be nurtured to foster a larger impact. The weaknesses identified such as funding, governance and political interferences impact the success of the projects and need to be addressed.

Reflecting on Siyavuna, the importance of the NPO sector is highlighted in intervening as the third sector in growing and developing the local economies in the country. Siyavuna has achieved successes in addressing food security, improving local skills, reducing unemployment and improving the quality of life of the rural community. Lessons learnt indicated the importance of partnerships that have been established between NPOs and

local government and that NPOs operate at 'grass roots level'. Some of the weaknesses include unrealistic mandates imposed on NPO and the 'top down' approach of government.

The contribution of case studies in LED is important to achieve the goal of lifelong learning in LED.

Global institutional behaviour in the market for 'Fine Art': Exploring art and innovation at the core of globalisation

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■ Abstract

This chapter explores how prices are determined in the international art market in terms of a behavioural economics model. Aspects of information, determining individual choice, cyclic relationships and uncertainty, as well as the market utility, all impact the demand for 'Fine Art' in the market. By using Tobin's Q theory of real investment, the Artprice Global Index reflects how institutions regulate public information as an indication of risk or stability in the global market of art, antiquities and collectables. The hypothesis or proposition is that that the level of risk is mitigated through the transfer of information, and the more efficient the flow of such information appears, the greater the level of market stability.

However, prices are not based on all market information, and this implies that a degree of market inefficiency exists within the art market. This chapter explores the level of market efficiency that exists within the market for 'Fine Art', and highlights the relationship that exists between the international art price and the demand for art in the local market.

■ Introduction

The importance of arts and culture for LED is confirmed by the significant contribution of the arts and culture sector to the African economy. Approximately 4.2% of all jobs in South Africa fall within the culture sector (Hadisi & Snowball 2017). In 2015, the culture sector accounted for 6.72% of the total number of jobs in the country (Hadisi & Snowball 2017). However, the arts and culture sector of South Africa is greatly under-supported by official bodies, such as through government grants or fiscal spending as compared to other countries. The impact of the arts and culture sector on the household consumption expenditure is comparatively high, indicating that household spending on culture and recreation was approximately 7.4% in 2019, with an

overall contribution of 0.4% to the total GDP of South Africa (Stats SA 2019).

Statistics SA (2019) further indicated that the culture sector exerts the main influences on final consumption expenditure of households. The importance of the arts and culture sector on household spending is significant in that it provides both work opportunities and cultural enrichment, especially in regions that are often considered underdeveloped. The culture sector also plays a leading role in enriching people's lives and improving the overall quality of life. The arts and culture sector represents a nation's creative wealth, and it is increasingly recognised as an indispensable part of sustainable economic development (Kabunda 2014). A total of 22.1% of those linked to the arts and culture economy are unregistered and most often form a part of the informal sector (Hadisi & Snowball 2017).

The local art market is one of the most important and often the least understood sectors for local job creation within LED. The reason for the misunderstanding of this sector, is that, as a cultural economy, operates within the paradigm of inefficiency. 'Thinking about an economic mechanism within an inefficient market is like drinking water from a glass without a bottom'. Thomas Kuhn proposed in 1962 in the 'Structure of Scientific Revolution' paper, that those theories that operate within an inefficient market structure will, in theory, operate differently from the way in which they will operate in an efficient market structure (Baur & Els 2015).

In order to capitalise on the potential of creating the best work opportunities within the culture sector, it would then make sense to try and better understand the workings of the culture sector. In other words, policy makers would most likely ask themselves what would be required to generate 'market efficiency' within an 'inefficient market environment'? The answer to this question posed could be of practical use to both policy makers and business developers, especially when navigating the sub-terrain of LED.

The first assumption in this chapter is that 'Fine Art', like most cultural artefacts, has both a collective value and a subjective value (Baur 2014). Given limited informational constraints, the exchange does not always operate smoothly and effortlessly in an efficient manner. However, even though 'Fine Art' has collective value, the trade of these goods may still be subjective (Baur & Els 2014), in which case, different investors would perceive the value of a single object of 'Fine Art' differently, in an objective-subjective way.

A solution to this problem of objective-subjectivity is introduced by David, Oosterlinck and Szafarz (2013) and Dimson and Mussavian (2000) who propose that the markets are considered to be efficient only if the real price reflects all the available information to the market as suggested by Paul Samuelson in the mid-1960s (Dimson & Mussavian 2000). This is also referred to in behavioural finance as 'Representativeness', which is the decision-making process based on stereotypes, typically representative of all members of a group (Schmitz 2012). Prices are not specifically related to the intrinsic value of the goods. Prices reflect the extrinsic value of the good stored in the quantity of information made available at the point of the transaction. According to Schmitz, this is referred to as availability bias that occurs because decision makers rely on information to make informed decisions, but not all information is readily available.

■ Structural efficiency in the market for 'Fine Art'

Because cultural products are not heterogeneous, the market is not efficient, despite the large number of buyers and sellers. David et al. (2013) stressed the importance of understanding the role of information in the decision-making process when purchasing 'Fine Art'. Most profound is the concept that the sale of 'Fine Art' may seem to discredit the law of 'one price',

since there are cases where similar artworks fetched dramatically different prices when sold in different places. David et al. (2013) mentioned that efficiency because of profound data limitations is near impossible to test. Furthermore, 'prices' for 'Fine Art' did not follow a simple random walk hypothesis, implying that, there is order and structure within the creative industries.

Random walk hypothesis suggests that changes in the prices of 'Fine Art' have the same distribution, but prices are also independent of each other. Therefore, if there is no evidence of a 'random walk', then the past movement or trend of the art price can be used to predict the future movement of the art prices. The random walk hypothesis analysis on the Artprice Global Index is performed using the vector of Boolean decisions for the tests, with length equal to the number of tests. Values of h equal to 1 indicate rejection of the random-walk null in favour of the alternative. Values of h equal to 0 indicate a failure to reject the random-walk null. $H = 1$ and $p < 0.05$, thus rejecting the null hypothesis that there is a random walk present in the data. A variance analysis is conducted on the sample. For a random walk, these ratios are asymptotically equal to one. For a mean-reverting series, the ratios are less than one. For a mean-averting series, the ratios are greater than one. The ratio is 0.4189, with the vector of the critical values for the tests, for standard normal probabilities, proven at 1.9600.

When looking at the art market in the United States, it was highlighted that by using variance-ratio tests within the US auction market, there was no 'random walk'. Up until 1945 the auction market resolutely did not follow any 'random walk' over an extended period of time. However, it was also shown that US art auction prices followed a series of 'random walks' over short time intervals, starting from 1945 onwards. (David et al. 2013). This could imply that there are varying degrees of relevance associated with job creation within the creative industry.

The varying relevance of the culture sector in LED can be most often observed during times of economic shocks. The most recent of such economic shocks in the culture sector was experienced during the 2008 financial crisis and the impact of Brexit in 2016. The impact of the 2008 financial crisis was very noticeable in Figure 4.1 which marked the sharp decrease in the Artprice Global Index, and an additional change to this index again in 2016 was also noticeable as per the impact of Brexit (Baur 2019).

An analysis of the Artprice Global Index indicated an estimated value of negative 0.19038, the strong elastic (price sensitivity) relationship between the Brexit event and the index which proves that the influence of Brexit on the index was quite significant. From this, it could be seen that the Artprice Global Index is very sensitive to external events. The financial crisis of 2008 was relatively inelastic in comparison to that of Brexit but still maintained a large degree of significance. The significance referred to here is most often through the relationship between the culture sector of an economy and the flow of tourists into a country.
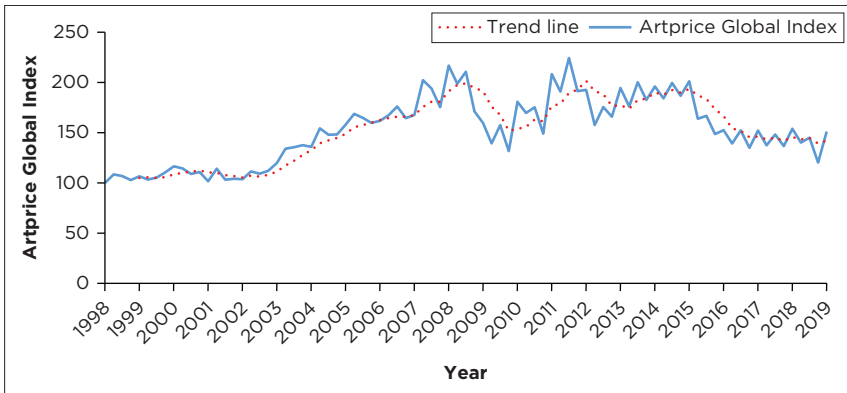
Source: Artprice.com (2019).

FIGURE 4.1: Artprice Global Index and the associated trend line between 1998 and 2019 (1998 = 100).
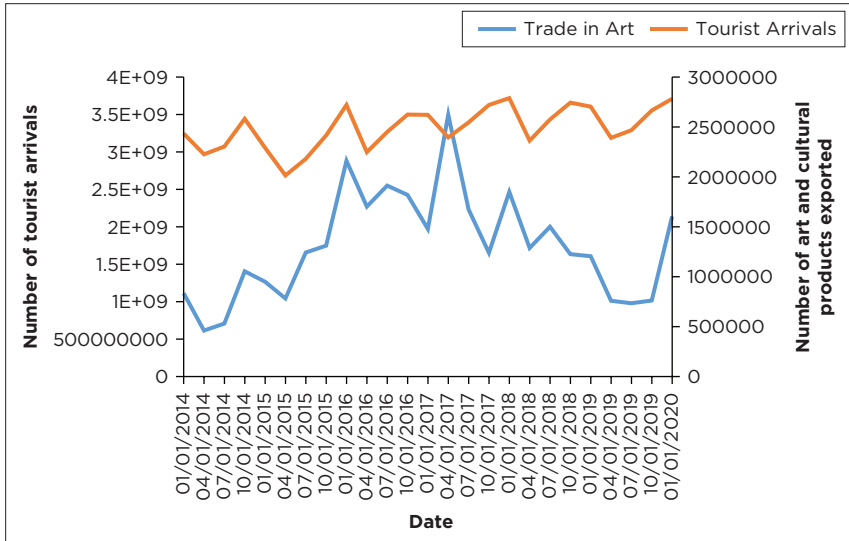
FIGURE 4.2: The export of art and cultural products from South Africa and the number of tourist arrivals between 2014 and 2020.

The trade of art in the local art market is mainly done through the sale of local art to tourists. From an LED perspective, this is important to a country such as South Africa as the relationship between the arts and culture sector of the economy and the growth of careers within the arts and culture sector is significant to LED. Tourism and hospitality have had a direct impact on the local art markets, including hotels, restaurants, non-essential retail trade, tourism and significant share of skilled manufacturing (World Health Assembly 2020).

■ Developing a sound market proposition by exploring levels of market efficiency within local economic development

It was mentioned earlier that many of the LED activities, especially those associated with the cultural industries, operate within an

inefficient market environment. This also has a tendency to give the impression of market uncertainty within this sector. Market efficiency and market uncertainty are two concepts that should not be confused with each other. Market efficiency refers to the degree to which market prices reflect all available and relevant information. While known factors are already reflected in efficient market prices, the main sources of market uncertainty are the unknown factors. Efficient market prices can be considered as correct only in reference to a set of known factors. The most common and extreme example is the level of global uncertainty The measurement of global uncertainty is reflected in the international gold price, as per Figure 4.3. As the level of global uncertainty increases, either through an event or a shock, the price of gold tends to increase. For example, in the event of an economic shock, the price of gold begins to increase. However, there is a remarkably close relationship between gold price and the price of cultural goods, especially the price of art.
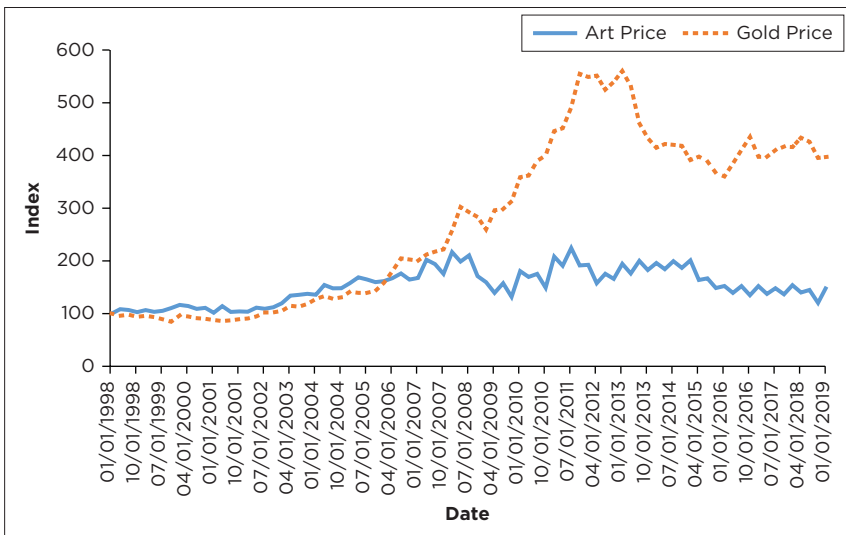
Source: Quantec (2019) and Artprice.com (2019).

FIGURE 4.3: Comparing the Artprice Global Index and the Gold Price Index between 1998 and 2019 (1998 = 100).

At the time of this study, there was a positive 64% correlation between the change in Gold Price Index and the change in the Artprice Global Index. This implies that there is a significant positive relationship between the impact of an economic shock and an increase in the price of cultural products. This can be easily explained as an increase in market risk causes an increase in the international trade in 'Fine Art'. A study examining the relationship between the gold price in US$ and the Growth of Investment in Cultural Industries indicated a positive 88.64%. In other words, from a portfolio perspective, risk events result in some investors restructuring their portfolio to include cultural goods such as fine art into their portfolios. This way, an investor is able to hedge against the risk induced by an economic shock. This became very obvious in the United Kingdom, where it was found that jobs for artists within the United Kingdom increased during the Brexit event (Baur 2019).

The creation of work opportunities because of an economic shock is a consequence of the degree of efficiency that exists within the LED environment. There are several forms of efficiency considered within the literature and these levels of efficiency are a result of available information regarding the cultural market or the specific cultural product being traded. These efficiencies range from strong market efficiency to weak market efficiency. While weak market efficiency could imply market chaos, a strong form of market efficiency would suggest that prices reflect lots of available market information.

Information is stored in either the private or the public domain. Information in the public domain is relatively easily available via the internet or through agencies or public forums. Information stored in private domains would be more difficult to access, or would come at a price or simply not be made available. The relationship between the shift in information between this public and private domain explains the degree of market efficiency.

In this strong form of market efficiency, there are greater levels of available information associated with relatively lower levels of market risk.

A semi-strong market efficiency represents some grey area in the market. Here prices only reflect all publicly available information but the prices do not directly reflect the information held by the private domain. It is here that prices change to reflect public opinion (David et al. 2013) but do not include all information. Given the nature of the culture sector within a local economic framework, and given the cultural significance to a local community, the objective-subjectivity implied through access to the 'available' information determines the value underlying the cultural artefacts, which leads to price subjectivity of cultural artefacts.

However, when considering the weak form of market efficiency, the availability of public and private information is very limited. The institutions themselves determine the quantity and quality of 'available' information.

■ Irrationality, imperfect information and market inefficiency

Neoclassical economics proposes that within rational choice theory, all individuals use rational logic to make rational choices in line with their own personal objectives. According to the rational choice theory, the key assumptions are based on rational decision makers who are making rational choices given 'available' information. In an efficient market, prices reflect what can be referred to as 'fundamental value'. This 'fundamental value' is based on the access to information for market participants. The belief in efficiency assumes that when prices do not reflect real value, the market will correct itself to settle at a suitable price (Schmitz 2012).

Robert Shiller (1996, cited in Harford & Alexander 2013) wrote that 'market volatility is too high for the efficient markets theory to be true'. According to Shiller (1996), 'markets have a tendency to overreact to news, or to react to non-news'. The reason that market inefficiency is rooted in the market mechanism (David et al. 2013)

is that imperfect information is a predominant cause of irrational behaviour within the market (Frey 1997). Keynes (1936) links this inefficiency hypothesis to decision-making within the art market by proposing that all sorts of information need to be considered when making decisions. This sometimes manifests itself in the problem of market overreaction (Erdos & Ormos 2010). Brunnermeier (2005) proposes the concept of 'information efficiency' (available information), which refers to the availability of information for a specific product within a specific market.

Gilson and Kraagman (2014) suggest that 'fundamental efficiency' and available information for that product are related. They propose that it is difficult to observe fundamental efficiency because markets tend to over- or under-react. However, estimating available information may be easier to observe. It is 'fundamental efficiency' which focuses on the decision maker and assumes that decision makers are always rational, and when new information becomes available, this information gets incorporated and expectations will change. In other words, the market will reflect an 'acceptable' market price.

However, available information is distorted by the level of 'noise' in the available market information. 'Noise' in a market is a measure of market fluctuations that occur. News feeds, rumours, market speculation and other spurious information typically cause short-term price fluctuations. Erdos and Orms (2010) state that a characteristic component of inefficiency in the market is driven by a 'noise'. While 'noise' is not the focus of this chapter, it is an important component of better understanding the role of information in determining a market price.

Another problem that occurs within inefficient markets is the problem of 'white noise'. The level of 'white noise' in the market is an indicator of information efficiency. 'White noise' in a market is a measure of market fluctuations that occur. News feeds, rumours, market speculation and other spurious information typically cause short-term price fluctuations. Erdos and Orms (2010), state that a characteristic component of inefficiency in

the market is driven by a 'white noise' process. While 'white noise' is not the focus of this chapter, it is an important component of better understanding the role of information in determining a market price. 'White noise' is considered to be a random collection of uncorrelated variables or, in other words, the data are influenced by an unsystematic error. The presence of a specific variable would have no causal relationship with any other variable or phenomenon. To estimate if the variance is created by 'white noise', the Ljung-Box Statistic is applied to the Artprice Global Index. In this study, it was found that there is no evidence of white noise in the market (Baur 2019).

■ Drafting the relationship between the private and the public domains to determine price using the share of available information

Two types of 'value' should be considered, namely 'market price' and 'fundamental value'. The market price for the product is observable while the 'fundamental value' of that product is not clearly apparent (Gilson & Kraakman 2014). Typically, in an efficient market, assuming rational agents, all information is relevant to determining an artefact's 'fundamental value'. Market efficiency assumes that information is freely available to the buyers and sellers. Thaler, Sunstein and Lewis (2008) pose a very important question, namely, why do the decision makers make so many colossal mistakes (Thaler et al. 2008)? Firstly, people overgeneralise. Secondly, they base their information on recent events, even though previous performance is not always a good guide. Thirdly, people are biased. Tversky and Kahneman (1982) have shown that people often assess the probability of an event by asking whether relevant information is cognitively available (Tversky & Kahneman 1982): 'We suspect that countless areas of enterprise, both within the private and public domains, use *the availability of* "information" to gain a market advantage'.

Earlier it was mentioned that information is available within two domains, the private domain and the public domain. The difference between each of these two domains is accessibility. Information in the private domain, or, in other words, Private Information has two components. Firstly, the information regarding the market environment and secondly, the core characteristics that are inherent within each item relating to the traded artefact. This embodies the knowledge held by any specific investor relating to the asset traded.

But information regarding the product does not remain only in one domain or the other. Information that was held in the public domain, and is captured in the private domain. For example, the setting up of a price index and then making it only available for paying members to use. However, information may move between the domains. An information-efficient price may change as information hidden in the private domain flows into the public domain. This is most obvious when prices converge as the beliefs around the value of the art work are strengthened. The more the private information associated with that asset, and given the number of barriers to gaining access to such information (such as individuals having access to specialised knowledge), the less chance there is in coming to a generalised consensus on the value. This has an impact on setting the prices of the artefact. Another challenge is that holding information is not free of cost. If the private domain chooses to hold information, it remains expensive for the private domain to hold that information.

Observable information fits into the public domain while unobservable information fits into the private domain. In the short run, the difference in information between the public and the private domains is at the core of understanding price-setting behaviour in the culture sector. The focus is to determine both the optimal trading strategy and the implications of this trading behaviour on the art market. Figure 4.4a and Figure 4.4b show the relationship between the distribution of information between the public and private domains within the secondary art market.
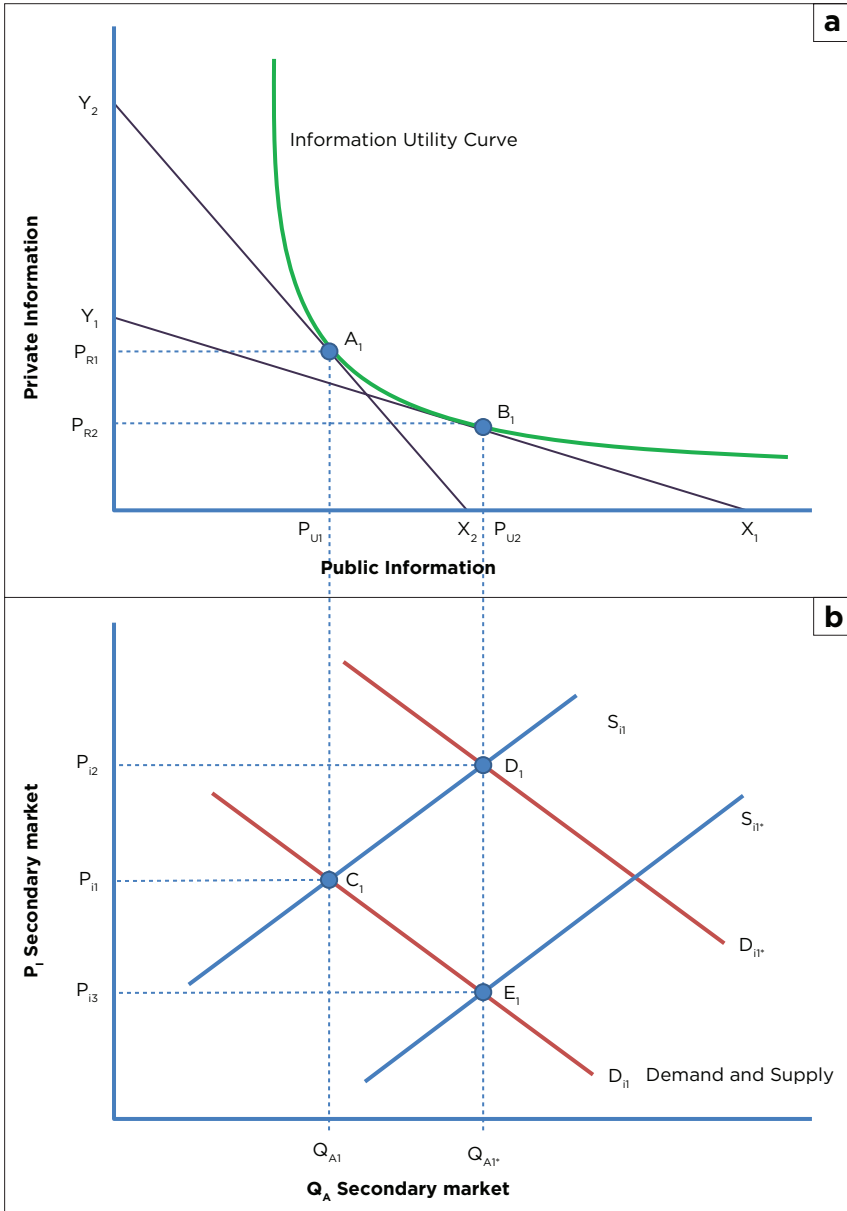
Source: Baur and Els (2015).

FIGURE 4.4: The demand for (a) information in the secondary art market, and the (b) role of institutions as regulators.

It is assumed that before the transmission mechanism, the demand for information rests at C_1 on D_{i1} (Figure 4.4b). Due to the transmission mechanism between the secondary and the primary art market, the demand for additional information will shift the demand curve to the right from D_{i1} to D_{i1*}. As a result, the increase in demand will cause the 'value' of the information to increase (P_{i1} to P_{i2}) and a new point of equilibrium will settle at D_1.

For example, traders can exploit such information, especially if they expect to partially reverse their trade after the information has moved into the public domain. As long as there is a deficit of information, the price is expected to remain high or climb. A trader may purchase a product if he believes that the information remains in the private domain and the product will sell at a higher price and make a profit. But once information moves into the public domain, the price may fall. In other words, the trader will typically buy on rumours and sell as the information becomes known (Baur & Els 2015).

However, this also assumes that the market will overreact to the released information. The higher the 'value' of this information, the greater the shift from point A_1 to B_1 on the information utility curve, but this may not be as a result of information provided by the principal agents, but rather because of market fundamentals. The principal agents can respond by increasing the amount of information into the public domain shown as a movement from A_1 to B_1 on the Information Utility Curve, by a rightward shift of the supply curve S_{i1} to S_{i2}. A new equilibrium will be established at E_1 (Figure 4.4a), where the 'price' of information will seem less, allowing new traders the opportunity to invest in the market. It is important to remember that the institution tries to avoid revealing too much information to the market (Brunnermeier 2005).

However, there are costs associated with holding this information which can be described as the Principal Agent's Utility (isoquant). At point A_1 (Figure 4.4b), it is cost-effective for the principal agent to hold information as can be seen by the slope of the Y_2–X_2 cost curve (iso-cost). At this point, the cost of gaining new information

in the public domain is high, represented by X_2. However, as information is released into the public domain, the cost to the investor becomes less, but the cost to the principal agent to hold additional information is now much higher, as can be seen by the new placement of the cost curve (X_1–Y_1) (Baur & Els 2015).

Brunnermeier (2005) proposes that knowledge of past prices alone does not provide additional value to the trade decision. However, knowledge of (endogenous) past prices combined with (possibly 'outdated') private information does. This also implies that within the market for 'Fine Art', the more the public information that becomes available, the greater is the consensus between traders of 'Fine Art' to establish the value of a particular work of art (Baur & Els 2015). It can be seen that 'since the establishment of eBay in 1995, online sales of antiquities and other cultural objects have escalated progressively, both in monetary value and material volume' (Brodie 2017:20).

■ Placing information into the 'Fine Art' market: The role of the Internet

Through the process of globalisation, more individuals have access to the internet. The process of globalisation influences the availability of information, and ultimately the change in the trade of cultural artefacts. Brodie (2017) mentions that the internet has caused a shift in the nature of the antiquities market, from a low-volume, high-value trading model towards more of a high-volume, low-value one.

The value of internet trade is that most online auctions are open to the public. This allows for a more efficient flow of information. While the range of products traded online are quite extensive, of importance to LED are those products that operate in inefficient markets, such as works of art, antiques, rare coins and many other cultural products. Some auctions are open to dealers only, thus containing the flow of information between the
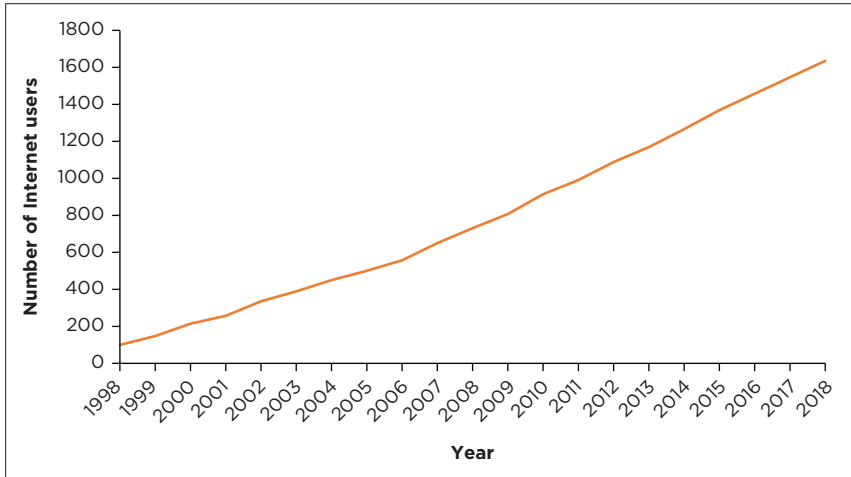
FIGURE 4.5: Access to the internet through the process of globalisation.

institution and the public. There are many companies that are currently hosting auctions on the internet (Turban 2007), and these include Sotheby's that commenced online streaming in 2015 and Christie's who established their own online platform in October 2016 (Brodie 2017).

There are additional benefits and limitations. According to Turban (2007), some online auctions allow individual sellers or companies to sell their goods efficiently. Furthermore, sellers may provide minimal information about their products. The auction process provides a greater range of potential buyers, assisting in moving products rapidly. Another benefit is that buyers have access to a larger variety of products, impacting greatly on the trade of collectables and antiques, which may not be locally available. Campbell (2005) proposes that the international market for 'Fine Art' is immense and the trade in cultural artefacts provides a new avenue for investment flows. During times of increasing globalisation coupled with the reduction in gains from diversifying assets across borders, the

electronic market for 'Fine Art' has provided a surge into various alternative investments. However, even within an efficient market structure, not all information provided contributes towards available information.

■ Applying Tobin to highlight the relationship between uncertainty and risk within the 'Fine Art' market

Informational efficiency can be abused within the market, leading to greater levels of market inefficiency. The abuse of information, such as in the case of an insider trader, reduces the efficiency of information, impacting on prices in the long run (Brunnermeier 2005) which in turn reduces the efficiency of the market. According to Singer (1978), the abuse of information may be apparent amongst some auction houses. In an analysis of piece-by-piece resale records of auction houses, Leslie Singer (1978) argues that there tends to be bias owing to the fact that rapidly appreciating art works are promoted by auction houses, whereas the bulk of more moderately advancing (or even declining) art remains unpublicised (or is held).

The value of Art itself is based on the ability of investors to analyse the probability of the potential for returns to the investment, which then supports the concept of a subjective pricing structure. Ehrlich, Shin and Yin (2009) refer to the ability of investors to analyse the probability of potential for returns as 'human capital'. The value of the artwork depends on the ability of investors to determine the potential for return, which is based on a subjective reasoning (Baur & Els 2015). Ehrlich et al. (2009) refer to the ability of investors to determine returns as 'human capital'. The depth and extent of human capital determines the ability of an investor to choose an investment that provides the greatest returns, which is a function of their own private information or knowledge, thus referred to as 'human capital'.

There are two forms of 'human capital', namely, 'specific' human capital and 'general' human capital (Baur & Els 2015). Both the specific and the general forms of human capital operate within the decision-making process. Specific human capital could be seen as the knowledge that enhances the investor's ability to assimilate information about individual assets. However, general human capital increases the investor's efficiency in assimilating private information in order to better determine the 'value' of the art asset. Both the general human capital and the specific human capital act as forms of efficiency parameters that will enable the investor to form private forecasts that influence the decision-making ability of the investor (Ehrlich et al. 2009).

Private information about the art market is unusually vast, even when extending this to the broader impact of foreign exchange and other capital markets. Yet the influence of private information could vary across the different markets (Baur & Els 2015). This process may add to the collective ability of private information, by expanding into expertise or knowledge-based networks. The level of the impact is strongly supported through the globalisation process, giving traders, investors and institutions greater market efficiency.

In an efficient market, information is reflected in prices that are fundamentally efficient and also show high levels of available information. Art investors focus on gaining value because of increasing available information. They favour masterpieces as well as known artworks (Park et al. 2017). This implies that the return to investment in 'Fine Art' is a function of volatility (uncertainty), available information and the investment time horizon. Periods of financial instability are also associated with higher levels of market volatility. This volatility has the potential of increasing the level of uncertainty about the investment which affects the speed of adjustment towards long-term equilibrium (Holmes & Maghrebi 2015).

■ Determining the slope of the information curve

Figure 4.6a and Figure 4.6b highlight the changing relationship between the distribution of information between the public and private domains within the secondary art market and the corresponding movement in the supply and demand for the
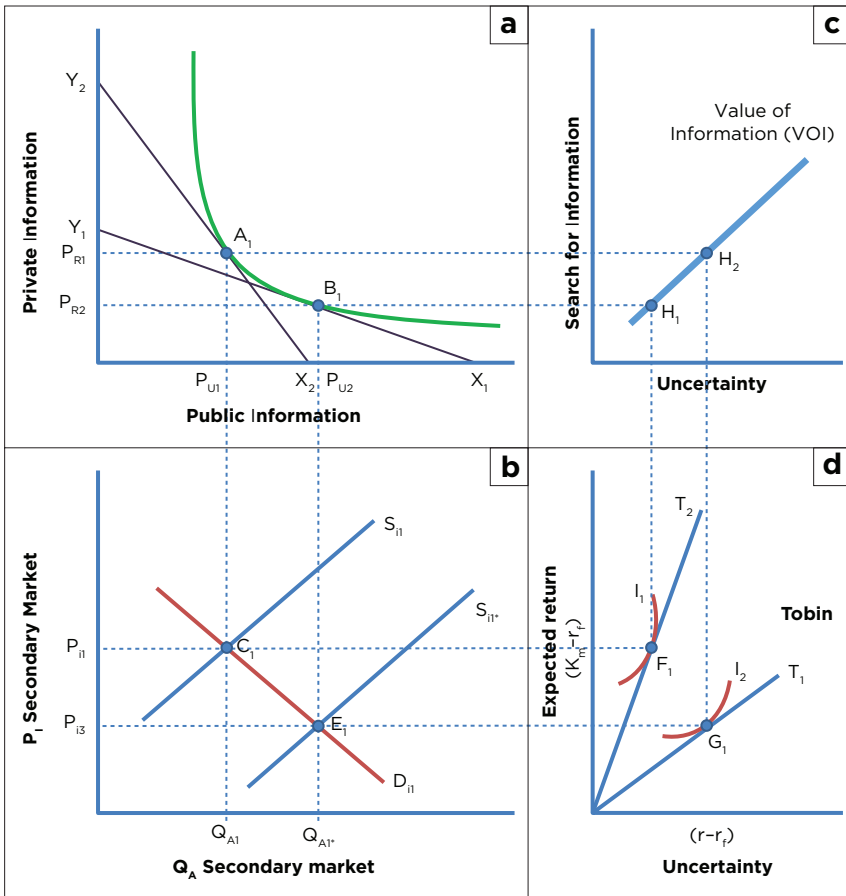
Source: Baur (2017).

FIGURE 4.6: Applying Tobin's model to determine the slope of the information curve. The demand for (a) information in the secondary art market, the (b) role of institutions as regulators, the (c) value of information, and (d) the relationship between the expected return and uncertainty.

respective works of art. As mentioned earlier with Figure 4.3, there is a movement in information between the secondary and the primary art market. Figure 4.6d depicts the relationship between the expected return and uncertainty as shown by the positive slope of the 'Value of Information' curve. (Baur 2017).

Conventional wisdom suggests that Tobin's model is an important indicator of investment behaviour that bridges the financial and real sides of the economy (Holmes & Maghrebi 2015). Tobin's criteria indicated that an increase in the levels of uncertainty is positively related to returns. In other words, higher returns are associated with higher risk that manifests itself in investor uncertainty and changing levels of volatility. Higher levels of uncertainty increase the 'value' of the information (Baur & Els 2015).

Baur and Els (2015) show that as the demand for information increases, the cost associated with holding information by the institution begins to rise, forcing the information to move from the private (institution) into the public (market) domain. This is shown as a swivel of the cost of information curve from Y_2X_2 to Y_1X_1, and a shift from A_1 to B_1 on the information isoquant of Figure 4.6a. The increase in information in Figure 4.6a is accompanied by an increase in the overall supply of art in the art market from S_{i1} to S_{i1*}, or a corresponding change in equilibrium of C_1 to E_1 in Figure 4.6b. At C_1 in Figure 4.6b, the expected returns are higher, indicated by P_{i1} in Figure 4.6b.

These lower returns caused the corresponding Tobin relationship to move from F_1 to G_1 in Figure 4.6c. The move from F_1 to G_1 is indicated by an increase in uncertainty $(r-r_f)$ and a decrease in expected returns (K_m-r_f), shown as a rightward movement of the investment line from I_1 to I_2 in Figure 4.6c. The market index for art begins to show lower returns compared to the comparative indices, such as the S&P 500. This causes an increase in uncertainty, portfolios begin to adjust with the changing expectations, and the rightward movement along the 'Value of Information' line, $(H_1$ to $H_2)$ in Figure 4.6d, resulting in an

increase in the search for new information. (Baur 2017). This search for information starts the entire cycle all over again.

Baur (2017) emphasises the fact that within the 'Fine Art' market, the concept of trading the level of uncertainty through the exchange of information creates its own value. This gives firms the chance to use strategies, such as arbitrage, to generate excess profits within the market. This is especially important when examining the market for 'Fine Art' which operates in an inefficient market environment. The aim of the art dealer is to maintain a higher value for the investments being traded within the inefficient market environment. It is here that uncertainty creates market opportunities, and while it may be difficult to offset the risk, the level of risk and the associated flow of available information creates order within the market environment.

■ Conclusion and recommendations

Tourism and the trade of cultural artefacts are a large part of any economy. Understanding how prices are set within these inefficient markets helps better solve the challenges of price distortions which are so often experienced both within the cultural economies and at a LED level. So often we can see that artists are underpaid for the work that they do, and traders of cultural artefacts often make profits well beyond belief, sometimes resulting in the trade of sensitive artefacts that are either protected or have a strong historical significance to a region. The appropriate setting of prices is critical to survival of the cultural industries, and the proper management of tourism. In some cases, the nature of the tourist becomes so specialised, such as specialising in the trade of art, that they may be given the name, 'cultural tourists'.

One of the most fascinating features of the 'Fine Art' market is that the art market operates within an inefficient market in a very efficient way. Art is a unique form of asset, holding within it many different layers of information which could be used to

determine value. Some layers are socially driven, while others may have a very personal contextual meaning for the investor. There are also other factors that play an important role in price determination, some historical and some random.

This chapter examined the most important issues of art market behaviour through institutional asset pricing. The relationship between available information and the volatility of the asset over a time horizon provides the market with hints about the value of the asset within an inefficient market structure. Institutions play an important role in that they are the custodians of the art market, and these institutions help to provide order within an otherwise chaotic art market by creating stability, building confidence and reducing market risk. The role of these institutions is of particular importance to LED. Arts and culture provide a platform to support work opportunities and simultaneously preserve a cultural heritage. A nation that does not protect its heritage is a nation without history; therefore, it is recommended that municipal LED strategies should attract investment into the arts and crafts in order to protect the memory of local cultures by integrating knowledge and information of local people with income-generating tourism. The flow of tourism into regions becomes the very life source for some communities; it is therefore recommended that tourism strategies support the maintenance of traditions and cultures of local communities, preserving elements of their heritage, and their cultural norms.

The role of tourism and the development of technology within an online framework is an extremely important marketing tool which, through globalisation, bridges the gap between local and international art markets. It is through the process of globalisation that markets are brought together, opening unlimited trade avenues and allowing people to experience new and exciting cultures. The art market will remain unique as compared to other markets in that it touches not just the minds, but also the hearts of everyone involved.

Part 3

Rethinking the role of higher education

Pivoting higher education and training towards agility and flexibility in critical times

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■ Abstract

The higher education and training system is part of a larger ecosystem that includes schooling, post-school education and training (PSET) at universities, colleges and skills development provision. This chapter focuses on higher education which itself functions within an ecosystem at micro, meso, exo and macro levels. Each of these levels in turn 'implicates' higher education in certain behaviour patterns and approaches, which have largely been framed by long-existing paradigms and legislative imperatives prescribed by legislators and regulators. This chapter seeks to highlight three critical issues that are disruptors to higher education, and which underpin the necessity for higher education to pivot towards agility and flexibility, in order to survive and grow in the face of major changes. These three critical issues are the impact of the Fourth – and even Fifth – Industrial Revolution; the changing world of work and jobs and the impact of the global COVID-19 pandemic. This chapter presents a view that it is not the 'fittest' that will survive immense change in such a short period of time; rather it is those systems and organisations that are agile, flexible, adaptable and are able to align, that will be able to create a new environment and navigate the changes sustainably.

The methodology has mainly been a desktop literature review combined with findings from a recent survey on the readiness of private higher education institutions to manage the gradual unlocking of the COVID-19 lockdown. This chapter initially presents a view about the relationships between the higher education ecosystems and then briefly examines the three critical issues. The view presented in the chapter is that new realities will emerge out of the richness of collaboration and cooperation between people using appropriate tools and approaches for a truly new and co-created higher education ecosystem.

■ Introduction

The current COVID-19 pandemic has thrown the world as we know (and knew) it into a situation where future outcomes are

mostly unclear and filled with 'wicked problem[s]' (Hanstedt 2020). Horst Rittel and Melvin Webber (1973:155) were the first scholars to conceptualise and define 'wicked problems' as 'those for which there are no solutions in the sense of definitive and objective answers'. The term and definition have been nuanced differently over the years by a number of scholars, such as Catrien Termeer, Art Dewulf and Robbert Biesbroek (2019:167) who define 'wicked problems' as 'contemporary problems that are particularly challenging, confront societal and policy actors and existing institutional regimes'. In this chapter, the concept of 'wicked problems' to describe COVID-19, for example, is not dissimilar to the definitions provided above.

It is becoming increasingly apparent that broader implications and impacts on socio-economic, community and personal environments, including higher education from the COVID-19 pandemic are still unknown. Applying existing systems and approaches to address economic and emotional challenges appear not to be working (Altbach & De Wit 2020:3; Edersheim 2020). This chapter focuses on the impact on higher education and the need for higher education to pivot from its current ecosystem state towards a state that is agile, flexible and adaptable enough to deal with shifting landscapes in critical times.

The ecosystem referred to in this chapter comprises micro, meso, exo and macro systems (see Figure 5.1). Each of these systems in turn 'implicates' higher education in certain behaviour
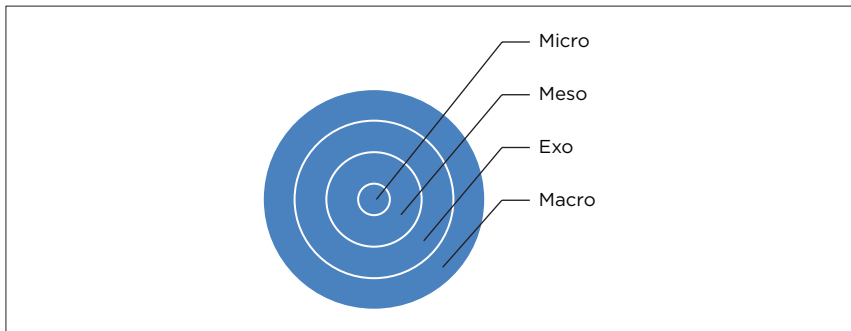
FIGURE 5.1: Higher education ecosystem comprising micro, meso, exo and macro systems.

patterns and approaches that have largely been framed by long-existing paradigms, and legislative imperatives prescribed by legislators and regulators. The purpose of this chapter is to highlight three critical issues that are disruptors to the current state of higher education. It is proposed that they underpin the necessity for higher education to pivot towards agility and flexibility, in order to survive and grow in the face of major changes. These three critical issues are: the expected impacts of the Fourth and Fifth Industrial Revolution, the changing world of work and jobs, and the impact of the global COVID-19 pandemic on higher education. The methodology has mainly been a desktop literature review combined with findings from a recent survey on the readiness of private higher education institutions (HEIs) to manage the gradual unlocking of the COVID-19 lockdown.

■ The higher education ecosystem

Urie Bronfenbrenner (who developed his ecological system theory) and Pamela Morris (1998) describe the complex system of relationships that are affected by multiple levels of environmental factors. Although Bronfenbrenner's theory was developed to describe how these systems affect child development, an ecosystemic perspective is used in this chapter to describe the complex system of relationships of the higher education ecosystem, and how each of these is being challenged to respond to profound changes in critical times. Ludwig Von Bertalanffy (1968:32, 34) initially described systems as 'complexes of elements standing in interaction', and postulated a new scientific discipline which he called 'general system theory'. Building on Bertalanffy's theory, Clark (2004) proposed that systems are in continual evolution through which they can acquire qualitatively new properties through emergence. A report by the OECD (2017:5) found that 'systems approaches, especially coupled with design, enable organizations to better manage complexity by striking a balance between simplification and complexification'. Benjamin Anderson and Marla Koonin (2020) speak about 'actualising an ecosystem' in which development is defined as a person's evolving perception of the ecological environment, and his/

her relation to it, as well as the individual's growing capacity to discover, sustain or alter its properties. Anderson and Koonin (2020) propose that people should become ever more articulate in influencing the understanding of the systems in which they operate, and ever more aware of the different layers of the ecosystem and the trajectory of their organisations.

■ The micro, meso, exo and macro systems in the higher education ecosystem

The 'micro system' is the innermost system and part of the individual's most immediate environment. It refers to 'institutions and groups that most immediately and directly impact the individual's development'. Relationships are bi-directional, such as the individual in relation to other students, peers, family, lecturers, student organisations and the HEI itself. The 'meso system' consists of interconnections and interactions between different parts of micro systems, for example between the parents and the HEI, the family and the individual's peers or lecturers or the environmental interaction between the home and the HEI. The 'exo system' involves links between social settings and external factors 'that do not involve the individual as an active participant' but still affects the individual. Examples are mass media, the world of work, industry, local politics, student formations, programme design, delivery modes, HEI management decisions and external networks of influence, such as funders, sponsors and alumni associations. The 'macro system' is an all-encompassing system describing the overarching culture that influences the individual and within which the micro, meso and exo systems are embedded. Examples are a mutual political belief system, government policies, laws, values, culture, customs, resources, a mutual religious belief system and a shared socio-economic system.

Each of these systems will be deeply impacted by the changes required in critical times. The depth and breadth of the impact will most likely be determined by how higher education 'can

account for uncertainty while managing greater complexity and still deliver effective services' (OECD 2017:5), and make decisions that lead to resilient systems and adaptive structures. The three critical disruptors that are discussed later in the chapter are expected to be key drivers for change.

At all levels of the ecosystem, the people and the practitioners involved will need to reflect and acknowledge that outcomes may vary, be unpredictable and that systems may need to be adapted to accommodate what will emerge (OECD 2017:6).

Paul Hanstedt (2020) characterises the higher education system as one which in the past had been structured in a manner that fails to parallel the flux and flow of life after graduation. He describes a traditional higher education system as a bureaucratic system that has not been agile enough to manage critical change when needed. Higher education institutions, both public and private, are legislated, regulated and influenced at the macro and exo levels by global movements and shifts, national government departments, public entities responsible for accreditation, quality assurance and qualification registration and socio-economic environments. These in turn influence what happens on the meso and micro levels. It may not be so strange that HEIs have not been as agile and flexible as they need to be in critical times, when considering the findings in the OECD report (2017) that:

> Public administration systems based on command-and-control models have proven to function well in stable systems with linear cause-and-effect relationships. However, bureaucratic organizations have proven ill-fitted to provide effective responses to problems that are hard-to-predict, difficult to diagnose, of unclear nature, and involving multiple stakeholders. (p. 5)

Change which follows 'an incremental, step-wise' approach (OECD 2017:6), will not work anymore, as many of the problems today are 'wicked', and their impacts and implications unknowable. The next section describes the disruptors that are 'catapulting' the higher education ecosystem into a new way of doing and being, in a world experiencing unprecedented uncertainty, complexity and volatility.

■ The three disruptors

Roberta Basset (2020:5, 6) describes the traditional core values of higher education as 'equity, a baseline of quality, accountability, institutional autonomy, academic freedom, and social responsibility'; and while complexity and uncertainty now appear to be the norm, new approaches and processes are emerging, which are not yet grounded in empirical findings, to deal with the new realities being faced by institutions. The world seems to operate based on a new set of rules that are difficult to observe directly.

This section describes the three disruptors, namely the impact of the Fourth and Fifth Industrial Revolution; the changing world of work and jobs and the impact of the global COVID-19 pandemic.

■ The Fourth and Fifth Industrial Revolution

The seismic shift in focus on all forms of teaching, learning, assessment and awards happening across education and training environments are being driven, *inter alia,* by the dynamics emerging from the Fourth and Fifth Industrial Revolution. Bryan Penprase (2018) reminds us that the Fourth and Fifth Industrial Revolution forces us to think innovatively and creatively about the whole value chain of teaching, learning and assessment across higher education. In a Fourth Industrial Revolution world, emphasis is placed on robotics, AI, augmented reality, virtual reality and the 'internet of things', with an almost Orwellian ability to eclipse humanity by the momentum of technology (Gauri & Van Eerden 2019). The Fifth Industrial Revolution world is seen as one in which the agency of humans and machines will be coordinated to be more efficient (machines) and effective (humans) in the workplace (Lindsay & Hudson 2019).

Griffin (2013) and Penprase (2018) locate the origin of the term 'industrial revolution' back to an 1884 work by Arnold Toynbee titled *Lectures on the Industrial Revolution*, in which the term 'revolution' describes significant shifts in financial, political

and social programmes based on mechanisation. Eric Hobsbawm (1999) viewed the economic growth associated with the industrial revolution as:

> An acceleration of growth because of, and through economic and social transformation. Social and educational transformations from the first 3IRs can provide a starting point in our consideration of the potential transformations in education and training arising from the 4IR. (p. 12)

☐ Emerging realities from the Fourth Industrial Revolution

The Fourth Industrial Revolution has been described as being all about 'automating processes and introducing edge computing in a distributed and intelligent manner, with its sole focus to improve efficiency of the process' (Nahavandi 2019:1–2); and 'as the result of integration and compounding effects of multiple "exponential technologies" such as AI, biotechnologies and nanomaterials' (Penprase 2018). The World Economic Forum (WEF) (2015) defined a set of tipping points at which technologies of the Fourth Industrial Revolution will become widespread enough to create massive societal change. The exact impacts of such technologies on society and the planet are still unknown – but the fact that they are bringing profound and rapid change is becoming evident in the fabric of socio-economic and community practices. The power of technologies of the Fourth Industrial Revolution for either positive social impacts or devastating environmental damage is upon us and the need for education and training to respond is urgent; as is, according to Penprase (2018), the 'potential irreversible loss of control over networks of powerful AI agents with increasing autonomy within financial sectors and within urban infrastructure' and terrorism.

The Fourth Industrial Revolution has brought about a number of change imperatives that are already impacting the higher education ecosystem. These include:

- Substantial changes to science, technology, engineering and mathematics (STEM) and science, technology, engineering, arts

and mathematics curricula (Penprase 2018) which will be required for students to develop capacity in the rapidly changing worlds of genomics, data science, AI, robotics and nanomaterials.

- The emerging development of hybrid online and in-person instruction, massive open online courses, video-conferencing and video-lecturing. A 2014 Massachusetts Institute of Technology report on the future of education at the institute strongly emphasises the need for leveraging online courses to strengthen residential courses for undergraduates, and to provide more flexibility and modularity of courses.
- The White Paper for Post-School Education and Training (DHET 2013), which presents a vision of online and open learning, and emphasises the importance of digitising learning records to assist credible and trustworthy global 'migration' of learners.
- 'Just-in-time' education and training, rather than 'just in case', which influences the curriculum, teaching and learning and assessment (Mezied 2016).
- Teaching that focuses more on teaching things such as creativity, spontaneity, communication and interpersonal relations (Blinder 2008:17).
- The development of a 'global identity' as individuals gain education and training from different institutions, work at diverse and global operations and participate actively with different initiatives, indicate that their identity is no longer tied to one organisation or HEI or college. Douglas van Houweling (in Mezied 2016) predicts the growth of the creation of a global identity as a key development in higher education in 20 years' time.
- The global referencing system UNESCO and the European Centre for the Development of Vocational Training released in 2019 that consolidates the global standards for higher education qualifications and provides referencing mechanisms in higher education qualifications to support increased access, mobility, credit accumulation and transfer, articulation for lifelong learning and skills development across regions and continents.

- A new initiative being coordinated by the European Training Foundation (Chakroun 2010), which aims to develop basic level descriptors for a global framework. The envisaged benefits of such global initiatives are the positioning of countries and their education and training systems for increased knowledge sharing, global mobility of lifelong learners and quality qualifications. Importantly, the foundation is also enabling mechanisms for refugees, migrants and displaced people who can now 'carry' their credentials with them.

The emergence of new ways of providing education at scale and the emergence of the 'flipped classroom' is described by Jennifer Roch (2016) as a hybrid model of the traditional models, digital classroom and open learning. A very simple way of describing the flipped classroom model is that there is (Roch 2016):

> [*T*]he desire to redirect attention in a classroom away from the teacher and onto the learners and the learning. In order to do this, most flipped classroom teachers ask one question: Which activities that do not require my physical presence can be shifted out of the class in order to give more class time to activities that are enhanced by my presence? (p. 22)

Not every learning experience that the institution offers will be a complete course; but learning will happen in blended or 'flipped' classroom modes. We will need to change the way we look at and/or define the 'classroom', and the teaching and learning environment. This also extends to learning materials that will shift to multimedia materials and libraries or 'digital repositories'. The Ernst and Young (2012:4) report on the 'University of the future' identifies the significant increase in the availability of knowledge *online;* the mass expansion of access to university education; the transformative effect of digital technologies and 'global mobility' as four of five 'drivers of change' for higher education.

☐ Emerging realities from the Fifth Industrial Revolution

Where the Fourth Industrial Revolution has been viewed as 'dehumanizing economic progress', with insufficient focus of

environmental protection and resulting in significant job losses because of automation, the Fifth Industrial Revolution in contrast, seeks a better technological solution that brings coordination of the human and the machine back into play. Gauri and Van Eeden (2019:2) and Marc Benioff (2019:2) view this move as one which will restore focus on environmental sustainability, and coordinate the agency of humans and machines in contexts in which 'humans and machines will dance together, metaphorically. But it will require intentionality and moral clarity'. Saeid Nahavandi (2019:11) reinforces the concept of moral clarity when he writes about 'ethical principles, and ethical behaviour solutions in autonomous systems' and the need for trust and reliability between automation and humans to achieve the envisaged 'promised efficiency'. Nahavandi (2019:11) suggests that the Fifth Industrial Revolution will emerge 'when its three major elements – devices, intelligent systems and intelligent automation – fully merge with the physical world in cooperation with human intelligence'.

Tony Joseph (2020) identifies four elements of the Fifth Industrial Revolution which bring the focus back to humanity and places greater importance on human intelligence. These are:

1. Uncaging recruiters, whereby recruiters can make use of AI to capture better profile matches, and create a more personalised experience for the job-seeking candidate.
2. Putting women at the forefront, as it is envisaged that the Fifth Industrial Revolution will play a critical part in shaping the role of women as businesses will hire unbiasedly.
3. Preventing the repetition of Engels' Pause, which describes the stagnation of real wages paid to people for about 50 years as a result of the Industrial Revolution. It is estimated that the Fifth Industrial Revolution has the potential to prevent such stagnation, as it opens the way to curiosity, creativity, empathy and judgement, ensuring a balance between people and technology.
4. Changing the way people work because they will no longer work a 'nine to five' job, and the use of virtual training and information-sharing. This means that new recruits will be able

to receive up-to-date information virtually and it will make on-boarding and ongoing training cheaper.

The view about virtual training is supported by Nahavandi (2019:6) who describes virtual training to develop a skilled workforce as safe and accurate and cost-effective.

The potential impact at all levels of the higher education ecosystem by both the Fourth and the Fifth Industrial Revolution is not doubted. What is apparent is that the mind shifts and conceptual frameworks developed by HEIs and the regulatory bodies will have to be revisited to include both the cyber-automated systems of the Fourth Industrial Revolution and the new way of transferring knowledge and skills from a digital and sometimes virtual world to its 'physical twin, securely and robustly' (Nahavandi 2019:7). These will be empowered by deep-learning strategies that should result in intelligent systems and solutions 'that can make decisions under unforeseen circumstances' (Nahavandi 2019:7).

■ The future of work

According to Ross Dawson (2018), despite a growing body of research in this area, 'there exists no universally accepted definition of what exactly the future of work encompasses and what the most relevant drivers are'. The 2018 International Labour Organization's (ILO) 'The future of work: A literature review' is a rich source of information based on 255 individual studies (Balliester & Elsheikhi 2018). What emerges from the ILO literature review is that 'no commonly accepted vision on the future of work has yet emerged. Neither is there agreement on the key drivers of change that will influence future jobs' (Dawson 2018). Most publications highlight the Fourth Industrial Revolution with a focus on the 'technological revolution', robotics, AI, genetics and so forth, but this report includes a bigger picture. Thereza Balliester and Adam Elsheikhi (2018:1) define the future of work along five dimensions:

1. the future of jobs (job creation, job destruction or the future composition of the labour force)

2. the quality of jobs
3. wage and income inequality
4. social protection systems
5. social dialogue and industrial relations.

☐ Potential job losses and job destruction

The 255 studies provide information about the impact of technology on job losses and job destruction. A random selection of elements from these studies which may impact job losses is provided below:

- Climate change and water shortages are expected to provoke increased migration, especially in geopolitically unstable regions (United Nations High Commissioner for Refugees [UNHCR] 2015).
- Even with falling global labour force participation rates, the challenge to create jobs remains substantial. Keith Breene (2016) estimates that as many as 500 million new jobs will need to be created by 2020 to enable opportunities for both current job seekers and those young people projected to join the workforce in upcoming years.
- Globally there will be an increase in female participation rates which is supported by declining fertility rates, a further development of the care sector and automation of housework, thus freeing women to join the labour market (Breene 2016; German Federal Ministry of Labour and Social Affairs 2016; Hardoon 2017; Nübler 2016).

☐ Job creation opportunities

The 2018 ILO study also found that it is anticipated that job creation opportunities will emerge from technological and other changes. Some of these findings from the ILO literature review are listed below:

- Preferences for human interaction in certain industries, such as elderly care and education, might prevent certain occupations from being automated (Finkel 2017).

- Luksha et al. (2015) found that several blue- and white-collar jobs will become obsolete soon; but the potential for job creation outweighs these redundancies. Due to new work practices and consumer needs, new jobs will be created and current ones adjusted.
- Blockchain holds capacity for job creation, for instance, the digital revolution may generate new jobs such as blockchain developers, internet of things architects and cognitive computer engineers (Finextra 2016; McKinsey & Company 2017).
- As many as 79% of executives in a study carried out by ServiceNow (2017) believe automation could lead to job creation. They also believe that automation spurs creativity since it frees up employees to do the work they want to do.
- Some studies estimate that technology could increase job opportunities in new occupations, especially in architecture, engineering, computers and mathematics (Breene 2016; German Federal Ministry of Labour and Social Affairs 2016; Smith & Anderson 2014).

Mauricio Armellini and Time Pike (2017) propose that jobs dependent on human traits – such as creativity and emotional intelligence – often used in service-related jobs, may become more numerous. According to Enrico Moretti (2010) in a US context, every new technology job will create around 4.9 additional local service jobs. This was confirmed by Maarten Goos, Jozef Konings and Marieke Vandeweyer (2015) who present similar findings using a European dataset. In other words, technology jobs play a critical role in creating demand for local service occupations. Additive manufacturing is a technology that may substantially influence manufacturing in the future of work. According to the WEF, advances in 3D printing might reduce the amount of labour needed in production, but these effects are likely to be outweighed by the birth of a new industry supplying printing materials (WEF 2015). The transformation to a greener economy, for instance, is a major factor that might impact the total number of jobs in future. Greening the economy is expected to create jobs in occupations such as energy auditors, climate change analysts and fuel cell

technicians (Pollin et al. 2014). New job opportunities are expected to arise in the care sectors, in line with population ageing.

☐ Implications of the future of work on the curriculum and learning programmes

Nancy Kline (1999:100) proposes that 'In every manager's training programme, in every MBA curriculum, the theory and process of a thinking environment should be fundamental. The future of work depends on it'. Luksha et al. (2015) emphasise the need for future employees to develop cross-professional skills in order to remain competitive. The critical cross-field outcomes, which are part of the generic skills sets described in the South African national qualifications framework (NQF), become important in a scenario where hard and soft cross-professional skills become necessary.

A challenge exists in the apparent lack of skills among young people to take up existing jobs, partly from a disconnect between what is taught in HEIs, and the dynamic needs of employers, thereby opening up a skills-gap (Balliester & Elsheikhi 2018; Breene 2016; Manyika et al. 2017; Nadler 2010). While the gaps are most pronounced in technical skills, such as degrees in STEM subjects, there are also significant gaps in communication, teamwork and other 'soft' skills (Balliester & Elsheikhi 2018; Russell Group 2017).

☐ Learning theories that will shape our conceptualisation of learning in the future of work

The sorts of skills, knowledge and competencies that people develop to successfully navigate work and workplaces in the future are receiving the attention of learning theorists and educationists alike. The challenges of mismatched knowledge and skills between what is taught and learnt, and what will be required in a future world of work, have to be addressed. Kline (1999:1) states that 'Everything we do depends for its quality on the thinking we do first'. Basil Bernstein (cited in Whitty et al.

2016:105) argues that children should be introduced to the 'universalistic meanings of public forms of thought, and have access to high status knowledge'. Shirley Walters and Bonnie Slade (2015) point out that several South African and international scholars are engaging actively again with learning and knowledge debates, about what should be in qualifications, what learning is, knowledge differentiation and so forth. Tara Fenwick (2013) points to the fact that *what* knowledge is, *what sort* of knowledge counts and *where* knowledge is created or accessed and internalised, is gaining increased prominence. Julia Evetts (2012) and Etienne Wenger and Beverly Trayner-Wenger (2013) write about the difficulty in developing standards for a profession as many professionals do not view what they *do* as 'knowledge'; rather that 'knowledge' equals 'theory' and practice is not viewed as knowledge. Peter Drucker (2003:x–xi) writes that 'Knowledge is different from all other resources; the knowledge that matters is subject to rapid and abrupt shifts'.

Knud Illeris (2018) states that:

> Learning can no longer be perceived of as merely the acquisition of a syllabus or curriculum; but that it covers all processes that lead to relatively lasting changes of capacity, whether they be of a motor, cognitive, psychodynamic or social character. (p. 2)

Yrjö Engeström (2018:46) asks '*Who* is learning? *Why* do they learn? *What* do they learn? *How* do they learn?' Sharan Merriam (2018:89) writes about '*holistic learning',* which is learning that takes place through pathways other than the brain (cognitive learning); our body, emotions and spirit are important avenues for learning or knowledge construction. Each level of the higher education ecosystem is drawn into the 'learning' discourse. Successful integration of what is taught and what is learnt and how this happens into the future of work, demands agility, flexibility and adaptability from the higher education system. This comes at a time that is punctuated with deep technological change and deep socio-economic, community and personal individual changes brought about by the turmoil created by the COVID-19 pandemic.

■ The COVID-19 pandemic

Of the three disruptors discussed in this chapter, the impact of the COVID-19 pandemic is the greatest at this critical time. The emergence and growth of the COVID-19 virus into a global pandemic has changed the world forever. It has been 100 years since a pandemic of such force and veracity has infected millions and killed hundreds of thousands of people. It has crippled industrial sectors, economies and health systems globally and caused global turmoil in education and training systems. It is estimated that over 200 million higher education students are directly affected as teaching and learning as we knew it ground to a halt, physical campuses were closed and higher education has globally been affected in a way last seen during WWII (Bassett 2020:6). Higher education institutions and governments are grappling with questions about how to pick up a crippled system and organise higher education around meaningful learning experiences.

The TPHE Collective (2020:1) states that the pandemic has 'thrown the world of higher education into turmoil', [...] and this is 'the perfect opportunity to assess what students actually learn, while others suggested that the "panic-gogy" emerging in this unprecedented time requires critical compassion'. They point to almost universally agreed elements that constitute what they term the 'mechanics' of teaching which encompasses 'implementing academic continuity, to keep teaching, pivot to remote instruction and transition to online course delivery, which unfortunately 'paper over learning' (The TPHE Collective 2020:2).

Hanstedt (2020) differentiates between the static university learning (mechanics) and the 'wicked fluidity' of the world right now. He calls for HEIs and academics to use this chaotic time to restructure learning and curricula that inculcate 'nimble' thinking, capacity to 'pivot quickly to different methodologies, ways of thinking, different concepts and modes of problem solving' (Hanstedt 2020). Hanstedt's proposal echoes the call by the TPHE Collective (2020:2) to pivot instruction to 'serve the central purpose of education: *learning*'.

The impacts at the macro and exo levels of the higher education ecosystem are reiterated by Altbach and De Wit (2020) who remind us that:

> [*M*]uch depends on the broader political and economic realities that will emerge from the crisis, and the impact on higher education recovery plans once the peak of the pandemic has passed. (n.p.)

The pandemic has caused a ground-breaking shift about what is taught, how it is taught and what is learnt. Out of the turmoil a picture appears to be emerging of a different approach to what happens in teaching and learning spaces, and a move away from rote learning and memorisation of answers (Hanstedt 2020; The TPHE Collective 2020). The pandemic has heightened the awareness about 'what learning is possible and what learning matters' (The TPHE Collective 2020:4–5). There is no doubt that online and digital learning have significant benefits in terms of cost-effectiveness when taken to scale, convenience for working students and the efficiencies around multimodality and online tools. Online learning also fosters 'a global online learning society, international partnerships and content sharing' (Amemado 2020:13). But online learning is not the panacea to fix all the current challenges.

The pandemic has also exacerbated inequalities, as most HEIs adopted an 'online' mode. Access to appropriate technology and internet speed – or even access to the internet at all – is a significant challenge, 'reflecting again, deep inequalities between students' (Altbach & De Wit 2020:4). Bassett (2020) writes that online and distance learning:

> [*Has*] forced massive adaptation in how information is delivered, strongly impacting how (and whether) students learn. But the implicit bias in this move, which assumes and requires a level of technical capacity, has left literally millions of students without any form of continued learning once they left their campuses. (p. 6)

Simply put, students who do not have access to the required technologies to participate in online learning are being left behind. All students deserve the opportunity to learn; therefore, accessibility and access are primary concerns (The TPHE Collective 2020:3).

Apart from inadequate access to technology and unstable internet challenges, the mechanics of online teaching and learning can leave much to be desired, and 'unreflective in-person pedagogy, translated into an even worse version online, does not serve students, faculty members, education institutions or society' (The TPHE Collective 2020:3).

Dodzi Amemado (2020) also highlights other challenges such as a possible lack of student self-motivation and self-organisation, the 'cultural' leap for lecturers and ensuring course quality. Amemado (2020:13) is of the view that 'with the COVID-19 pandemic, all these challenges are hampering universities' efforts to shift online'. At the micro, meso and exo levels of the higher education ecosystem (Amemado 2020):

> [*T*]he real challenge lies in how to make online education as good and reliable as possible, to maximize the quality of teaching and learning experiences, and to turn conventional universities into bimodal institutions. (p. 13)

■ Surveys conducted to gauge COVID-19 readiness

The Association of Private Providers of Education Training and Development (APPETD) responded to a request from the Minister of the Department of Higher Education and Training (DHET) to determine the state of readiness of private HEIs in the face of the COVID-19 crisis. The APPETD study in April and May 2020 consisted of two surveys followed by two Zoom meetings of its members. APPETD's member institutions offer qualifications from Level 5 on the NQF (higher certificate level) to doctoral degrees (NQF Level 10). The members of APPETD are part of what DHET refers to as the PSET ecosystem.

The results from the surveys present empirical evidence to support the findings in the literature emerging around the readiness of the global higher education system to function in a COVID-19 lockdown environment and a post-COVID-19 world, and the challenges that they face (APPETD 2020). The questions

asked during the electronic surveys focused on the preparedness of the institutions to manage teaching and learning off-site through remote learning, e-learning, distance learning or by using a blended approach. The surveys also aimed to establish the current readiness for implementing recovery plans when these are required. The responses from 194 APPETD members on three issues are summarised in Table 5.1.

Table 5.2 summarises challenges anticipated in dealing with the COVID-19 crises together with solutions proposed by the respondents. Additional challenges are listed in Table 5.3, together with recommendations on assistance that should be provided to enable training provision to commence during the lockdown.

TABLE 5.1: Findings of surveys of private HEIs and colleges on readiness to deal with the COVID-19 crisis.

Topic	Response	Comments
Strategy for online delivery	92% have a strategy for online delivery in place	The reasons for not having a strategy for online delivery: • Too few students have the access required for online learning • They are still investigating their options • Online learning is not an option
Internet capacity to offer programmes online	91% have sufficient internet capacity	Of the respondents who indicated that they have both a strategy and the internet capacity for online delivery: • 20% will require support, guidance and assistance with online delivery models to go online within 4 weeks • 36% will go online within 2 weeks • 12% would go online within 4 weeks • Other: 32%
Current mode of delivery	Contact/face-to-face: 44% Mixed/blended: 21% Distance/correspondence: 14% Online/digital: 18% Other: 3%	• 45% of the providers who had been offering only contact/face-to-face delivery had converted to delivering their content online as a result of the COVID-19 lockdown

COVID-19, coronavirus disease 2019; HEIs, higher education institutions.

TABLE 5.2: Preparing for COVID-19: Challenges and solutions.

Challenge	Proposed solutions
Determining institutional readiness for return of staff and students	• There is a need for a checklist to assist providers to determine the institution's readiness before the staggered returns should be considered. • The checklist results should be included in an institutional readiness and safety report that should be in line with government requirements.
Staggered return of staff to campuses	• Respondents are planning for a staggered return initially of staff, starting with 30% of the workforce that will then rotate or increase as the risk of COVID-19 allows. • This will save money on current very high data costs and will enable the campus call centres to be opened for staff to guide and advise students from these centres.
Staggered return of students	• Respondents are proposing a staggered return of students to campuses, starting with students who are most in need of support, because of lack of access to the technology to engage with online platform or unstable/irregular online access. • There will be staggered timetables over a longer work day. • Retired lecturers/educators will be used who can work from home to support teaching and learning. • Providers will adhere to social distancing which will determine class sizes and require the splitting of classes into smaller number of students.
Hard copy workbooks to support online delivery	• Lecturers/educators will develop learning materials and assessments for their programmes to support a blended approach, including workbooks to be made available in hard copy for remote learning purposes. • Workbooks can be delivered to students via 'Mr Delivery-type' services, with collections of completed workbooks twice a week.
Credible and valid assessment	• Respondents are considering current IT platforms for online assessment and moderation. • Respondents want to be assured that all assessments are credible and valid, and that the diverse forms of online and/or remote assessment mechanisms meet quality assurance standards. • Respondents are evaluating their current systems which already make use of credible online and distance models. • Some current IT platforms allow for evidence and/or responses to assessments to be uploaded directly onto the online system, and directly to the lecturers/educators for assessment and moderation. • Respondents are considering using a different approach to assessment, with more weighting on the formative assessments and less on the summative assessments.

COVID-19, coronavirus disease 2019; IT, information technology.

TABLE 5.3: Assistance needed for resuming programme delivery: Challenges and recommendations.

Challenge	Recommendations on assistance required and/or to be provided
Restriction on the delivery mode for accredited programmes	• DHET to issue a directive to quality assurance bodies to allow training providers the flexibility to offer programmes via e-learning, distance delivery or blended solutions for training programmes that are accredited for contact delivery. These bodies are the three quality councils responsible for sub-frameworks of the NQF, that is the Council on Higher Education, the Quality Council for Trades and Occupations and Umalusi, with the latter responsible for the school system. • Quality assurance bodies should allow for the flexibility of providers to change assessment processes and reduce the need for a final summative examination. • Quality assurance bodies should allow for changing the roll-out strategies so that work-integrated learning and work experience can be gained after companies have returned to work.
Student access to data	• The government should provide the same support for all students to access data, regardless of whether they are in a public or private university/college. • The DHET should engage with network service providers to provide stable internet connectivity for students. • Do not restrict the zero rating of data to South African service providers. Most HEIs also use international data service providers, which should also be funded by government.
Student access to computers	• The government to provide the same support for all students regardless of whether they are in a public or private university/college, e.g. by providing computers as many students studying through private providers do not have any access to computer equipment at home.
Student access to finance	• The government should provide the same support for all students regardless of whether they are studying through a public or private university/college. • Students and/or parents should be allowed to apply to a fund that should provide basic student grants to all students studying through public and private institutions.
Need for psychological support	• Wellness programmes could be provided by APPETD and made available free of charge for all students, parents, lecturers/educators and staff of educational institutions. The wellness programme should be offered in different modes, i.e. in hard copy for remote learning, online or via Skype or Zoom or similar.
Students' access to personal protection equipment	• The minimum of masks and sanitisers should be provided at all entry and exit points and in ablution facilities for all students in public and private universities/colleges.
Need for professional support	• APPETD could make a team of experts available to provide support in various fields, such as information sessions on e-learning and assessment strategies and discussion forums for areas of common interest and concern.

APPETD, Association of Private Providers of Education, Training and Development; DHET, Department of Higher Education and Training.

■ Conclusion and recommendations

This chapter reflects on whether the three disruptors – that is the Fourth and Fifth Industrial Revolution, the changing world of work and jobs and the impact of the global COVID-19 pandemic – are significant threats to the sustained positive growth of higher education or whether they present opportunities to reimagine and co-create a new, multimodal, agile, flexible and adaptable higher education system. The chapter proposes the latter.

At the micro level of the ecosystem, individuals have shown themselves to be highly adaptive, agile and flexible to embrace change. The APPETD study confirmed that the context, students and staff of the institutions adapted quickly to remote or off-site learning. At the meso level, sound interrelationships can develop and grow between the people and artefacts of micro systems if these are based on commitments to cooperation, communication and collaboration. The APPETD study indicates that staff of institutions who had previously offered blended and/or online learning were supportive of colleagues in institutions who had not yet ventured into online or blended learning modes. Cooperation and collaboration across institutions between lecturers in similar disciplines started happening. Sharing of knowledge and information became a key component of collaborative partnerships between institutions. At the exo and macro levels, qualification developers, quality assurance regulators, policy makers, organisations, organised business and labour, political, and religious and cultural systems are emerging from previously-held binary positions and paradigms, into an environment which is more collaborative. These engagements demonstrate a different understanding of agility and flexibility which can happen in renewed collaborative partnerships. This is reflective of the African philosophy of *Ubuntu*, derived from the Nguni aphorism 'umuntu ngumuntu ngabantu', which expresses shared humanity and mutuality in the belief that 'I am because you are'.

There are still significant challenges. The APPETD study confirms what emerged in the brief literature review of the impact of COVID-19 on higher education; that there is a digital divide, heightened by deep inequalities between those who have access to technology and the internet and those who do not. The quality of the online programmes in some cases has been less than acceptable, and educators and lecturers have realised that it is not good enough to convert the classroom notes into a few slides, delivered via Zoom or video sessions. There is a realisation that online teaching and preparation of materials require a unique set of skills and techniques. A significant challenge is that credible online assessment will require new ways of conducting assessment; and there is need to develop secure online systems that can be safely accessed by students doing assessments.

Solutions are being found through consultation, and are being implemented. Evidence of the finding of common ground in the education space in recent days is the zero-rating of data costs for both public and private education, and training institutions. Another example is the inclusion of private education providers in the government workshops to support all institutions to become ready for the return of staff and students to campuses as the COVID-19 lockdown restrictions are lifted. Solutions are being negotiated to address the inequalities in the education and training system, which have been so starkly thrown onto centre stage as institutions 'went online'. Remote learning is taking on a new meaning, as providers are designing quality distance learning material and using a 'Mr Delivery/Uber-education' type service to deliver and collect materials and question papers to and from students who have limited access to technology and internet. The reality of the depth of inequalities has spurred on many better-equipped institutions and practices to provide support to those who are in danger of being left behind.

This chapter presents the view that new realities will emerge out of the richness of collaboration and cooperation between people using appropriate tools and approaches for a truly

new and co-created higher education ecosystem. Four key recommendations emerge from this chapter of which the seeds are already tentatively sown. Firstly, the strengthening and continuation of the newly-established collaborative partnerships and communities of practice which have emerged. Secondly, the strengthening of emerging partnerships to develop credible and robust online assessment systems which can underpin online, distance and blended learning environments. A third recommendation is that new funding and resourcing models that are being developed using partnership models, should be finalised to deal swiftly and effectively to close the inequality gaps, so that no student is left behind. The fourth recommendation is that the emerging support models between institutions, which sidestep traditional fears of 'competition' and 'market share' are strengthened. The findings from the desktop research and survey confirm that at all levels of the higher education system are robust enough to pivot towards a truly agile, flexible and adaptable ecosystem in these critical times.

Shifting economies and the need for new skills

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■ Abstract

The purpose of this chapter is to identify the range of skills that would be required of employees working in industries that have adopted the disruptive technology of the Fourth Industrial Revolution. First, the concept of the Fourth Industrial Revolution

is defined and its opportunities and challenges highlighted. This is followed by a discussion of relevant skills demanded by the Fourth Industrial Revolution, namely technical, work readiness, soft/human and entrepreneurial skills. Thereafter, some implications of the Fourth Industrial Revolution for production processes, business, government, education and the individual are described. Possible future trends are presented. The WEF's strategic intelligence model of the Fourth Industrial Revolution is explored. In conclusion, to comply with the skills demands of the Fourth Industrial Revolution, an integrated approach to skills development would have to be adopted among educators, government and businesses, including addressing adult learning. The individual would have to develop a mindset of lifelong learning for continued employability.

■ Introduction

In this chapter, the concept of the Fourth Industrial Revolution is contextualised to enable the identification of the different types of skills that could be needed in the future. Owing to the continuous disruptive nature of new technologies, not only will the availability of the required skills be obligatory, but existing skills will have to be adapted and new skills developed. To comply with the skills demands of the Fourth Industrial Revolution, an integrated approach to skills development will have to be adopted by educators, government and businesses. Even the individual will have to develop a mindset of lifelong learning.

Therefore, the objective of this chapter is to first contextualise the concept of the Fourth Industrial Revolution and then to expand upon its requirements for different types of skills. The necessity for an integrated approach between education, government and business to address the skills gap and skills needs is expanded upon, as along with the commitment of the individual to lifelong learning.

■ Background

As a result of industrial revolutions, the focus of economies shifts depending on the nature of the industrial revolution. The Fourth Industrial Revolution is defined to help understand the current and possible shifts taking place in the world economies.

■ Fourth Industrial Revolution defined

In 2015, Klaus Schwab, founder and executive chairperson of the WEF, announced that the Fourth Industrial Revolution had commenced (Schwab 2015:1). The First Industrial Revolution started with the mechanisation of manufacturing driven by steam power. The Second Industrial Revolution commenced with the use of electrical energy, which enabled mass production (assembly lines) and extensive adoption of early technologies (telegraph, transportation, communication). The Third Industrial Revolution, in the early 1970s, heralded further automation through the use of electronics, information and communications technology (ICT), internet technology and the use of renewable energy. The Fourth Industrial Revolution is rooted in the use of cyber-physical systems such as robotics, AI, the internet of things, digitalisation and automation (Deloitte 2018:8).

Full consensus has not yet been reached regarding a definition of the Fourth Industrial Revolution. Schwab (2015:1) stated that the Fourth Industrial Revolution is 'characterised by a fusion of technologies that blurs the lines between the physical, digital and biological spheres'. Whereas the First and Second Industrial Revolution focused on modernising the physical sphere, the Third modernised cyberspace, while in the Fourth the physical sphere and cyberspace (actual and virtual spheres) are fused. While the First and Second Industrial Revolution established a centralised network, the Third developed decentralised networks with power delegated to decentralised nodes, and the Fourth created a distributed network with power equally distributed to all the connection points.

Thus, the Fourth Industrial Revolution is characterised by a pervasive and mobile internet, improved sensors and artificial and machine learning. The key technological dimensions of the Fourth Industrial Revolution include connectivity, big data, automatisation, intelligent agents, robotics, machine learning, AI, blockchains, sensors, virtuality, 3D printing and augmented reality (Lee et al. 2018:4). Technologies relevant to the Fourth Industrial Revolution are AI and robotics; ubiquitous linked sensors (the internet of things); virtual and augmented realities; additive manufacturing (3D printing); blockchain and distributed ledger technology; advances in nanomaterials, energy capture, storage and transmission and new computing technologies, biotechnologies, geoengineering, neurotechnology and space technologies (Trade & Industrial Policy Strategies [TIP] 2018:9).

Although several definitions of the Fourth Industrial Revolution have been proposed, a definition that seems to encapsulate its essence was proposed by a research team after in-depth brainstorming. They define it as 'the broad changes in industries as well as society that are affected by the disruptive technological changes in AI, automation, and hyper-connectivity' (Lee et al. 2018:7).

◼ Issues, controversies and problems

Four major technological disruptions have already been identified, namely the unification of AI and robotics, digitalisation technologies, new bio-based materials and energy sources and an evolution of the sharing economy with consumers playing a key role (Lee et al. 2018:3). These disruptions are changing the world of work and present not only opportunities but also challenges that require new skills.

◼ Disruptive technology and the world of work

The disruptive ability of technology can be linked to its velocity, scope and systems impact, and will result in shifts in power,

wealth and knowledge in most industries and all countries (Xu, David & Kim 2018:90). According to Schwab (2015:1), the vertical and horizontal extent of these disruptive technological changes will drive the transformation of entire systems of production, management and governance. It will shape the future of government, business, education, civil society and the individual.

■ Fourth Industrial Revolution opportunities

It is postulated by Xu et al. (2018:91–92) that five types of opportunities will arise as a result of the Fourth Industrial Revolution, linked to the current and future skills requirements:

• Barriers between inventors and markets are reduced because of new technologies. For example, in South Africa 3D printing enabled South African surgeons to 'make' a jaw implant because conventional options were not affordable (Coleman 2016:1). The product was therefore instantly available, shortening the route from production to customer. For entrepreneurs, start-up costs are thereby reduced and market entry barriers reduced.

• The exponential development in AI, with artificial systems rationally solving complex problems, creates new opportunities for economic growth and a more active role for AI. According to a McKinsey and Company report (Manyika et al. 2017:39), companies can utilise new technologies to automate not just low-wage work, but a substantial proportion of highly-paid work, and also create new types of jobs. By doing so, productivity will increase and costs, such as transportation and communication, will decrease. These could contribute to increased effectiveness of logistics and global supply chains resulting in a reduction in the cost of trade.

• The fusion of technologies is not the mere combination thereof, but the integration of different scientific and technical disciplines creating growth opportunities for each of the participants in the innovation domain. The integration of different fields of expertise helps create new products and

their concomitant markets. New markets will drive economic growth.

- Technology, specifically robotics, contributes to the improved quality of life for individuals at work and at home. Customised robots can perform routine tasks to allow individuals to focus on more cognitively advanced tasks.
- The extensive connectivity of devices, systems and services will increase the automation in most fields, thus enabling advanced applications.

This is not a comprehensive discussion of Fourth Industrial Revolution opportunities, but a preliminary classification. Nevertheless, it follows that the technological revolution could positively change the way people work, live and interact with each other. However, for some it may have negative implications.

■ Fourth Industrial Revolution challenges (negatives)

Schwab (2015:1) warns that the response to the technological revolution must be integrated, involving all stakeholders from both public and private sectors, as well as academia and civil society. Some of the challenges are discussed below:

- Computers and digitisation will replace low-skilled and low-wage jobs, which may contribute to greater inequality in the labour market. People with creative new ideas that can be converted into innovations will be considered a scarce resource and in high demand (Brynjolfsson, McAfee & Spence 2014:1).
- Technologies such as AI and robotics may replace and disrupt many jobs in labour-intensive industries and the services sector (Levin & Cunningham 2018:8).
- With all devices connected through the internet of things, current vulnerabilities in the network are raised, as well as demands for greater cybersecurity. Risks to the system may originate internally from either human error or sabotage, or externally through hackers, cyber terrorists or nature itself,

such as storms disrupting connectivity. In South Africa, frequent electricity cuts by Eskom is a serious risk to connectivity. Companies and individuals therefore have to invest in insurance and security measures.

- A number of negatives of the Fourth Industrial Revolution are highlighted by Lee et al. (2018:6). They purport that in society inequality may increase, the collapse of the middle class may be accelerated and social power may be polarised. In addition, they state that the roles of government and the global system may be reorganised. For the individual, they warn that it could lead to identity confusion and a misunderstanding of moral requirements.

In examining how the changing nature of innovation, following the digital revolution, is altering the world of work, Carl Benedikt Frey and Michael Osborne (2015:23) stressed that technology is not only enabling the automation of routine and repetitive tasks but also 'cognitive tasks involving subtle and non-routine judgement'.

In summary, in the Fourth Industrial Revolution it will be paramount to develop skills to survive the emerging social issues linked to productivity, jobs, quality of life and other social and ethical challenges (Lee et al. 2018:6).

■ Skills requirements in the Fourth Industrial Revolution

In its report entitled 'The future of jobs', the WEF (2018a:21) calculated the top emerging and declining jobs between 2013 and 2017 as observed in hiring trends. For sub-Saharan Africa, the top six emerging roles are those of a software engineer, marketing specialist, marketing manager, writer, financial advisor and data analyst. The six roles showing the greatest decline in the region are accountant, administrative assistant, mechanical technician, journalist and electrical technician. However, with the exponential advances in technology, skills needs are rapidly changing.

The WEF (2017b:iii) indicated that 'in South Africa alone, 39% of core skills required across occupations will be wholly different by 2020'.

This difference in skills needs is evident from the list of the top emerging jobs for 2020; jobs where demand has substantially grown over the past five years, and jobs where demand is expected to grow in 2020 (Akhtar 2020:1). It follows from Table 6.1 that 11 of the top 15 jobs require advanced technological skills. The high demand for AI specialists and robotic engineers is an indication that jobs in these areas will, in the future, replace or enhance existing jobs. However, two sales/customer-related jobs – customer success specialists (6th) and sales development representatives (7th) – are ranked amongst the top seven positions. This is indicative of the fact that even advanced technology products and services do not sell themselves, and it highlights the importance of customer satisfaction. It is not obvious why behavioural health technicians (9th) are in such high demand. Is hyper-connectivity causing behavioural problems, or are behavioural problems manifesting because of the severity of the unprecedented disruptive changes that humans are experiencing? However, Bakhshi et al. (2017:34) pointed out that the advances in the internet of things have resulted in: process efficiencies, understanding of customer behaviour, speed of decision-making, consistency of delivery and transparency of costs. Further research is required to understand the impact of the Fourth Industrial Revolution on human behaviour.

In a worldwide study focusing on the youth, Deloitte (2018:16) concluded that the skills required by this age group fall within four categories: workforce readiness; technical skills; soft skills and entrepreneurship. However, soft skills, also referred to as human skills, can be further divided into cognitive and behavioural skills. The typical skills required in each category are displayed in Table 6.2. However, jobs and concomitant skills are continuously changing, and therefore agility and lifelong learning are essential for individuals to progress through their careers.

TABLE 6.1: Top jobs for 2020 – Annual growth in demand over five years (LinkedIn).

Rank	Job title	Growth (%)	Skills unique to the job	Top industries hiring this talent
1.	Artificial intelligence specialists	74	Machine learning, deep-learning, TensorFlow, Python, natural language processing	Information technology and services, industrial automation, computer software, financial services, automotive
2.	Robotics engineers	40	Robotic process automation, UiPath, Blue Prism, Automation Anywhere, Robotics	Computer software, internet, information technology and services, higher education
3.	Data scientists	37	Machine learning, data science, Python, R, Apache Spark	Information technology and services, computer software, internet, financial services, higher education
4.	Full stack engineers	35	React.js, Node.js, JavaScript, AngularJS, cascading style sheets	Computer software, information technology and services, internet, financial services, higher education
5.	Site reliability engineers	34	Amazon Web Services, Ansible, Kubernetes, Docker products, Terraform	Internet, computer software, information technology and services, financial services, consumer electronics
6.	Customer success specialists	34	Software as a Service (SaaS), Salesforce, customer relationship management, account management, customer retention	Computer software, internet, information technology and services, marketing and advertising, financial services
7.	Sales development representatives	34	Salesforce, cold calling, Software as a Service (SaaS), lead generation, sales	Computer software, internet, information technology and services, marketing and advertising, computer and network security
8.	Data engineers	33	Apache Spark, Hadoop, Python, Extract/Transform/Load, Amazon Web Services	Information technology and services, internet, computer software, financial services, hospital and health care

Source: Adapted from Allana Akhtar (2020:1).

TABLE 6.1 (Continues...): Top jobs for 2020 – Annual growth in demand over five years (LinkedIn).

Rank	Job title	Growth (%)	Skills unique to the job	Top industries hiring this talent
9.	Behavioural health technicians	32	Applied behaviour analysis, autism spectrum disorders, behavioural health, mental health	Mental health care, hospital and health care, individual and family services, education management, health, wellness and fitness
10.	Cybersecurity specialists	30	Cybersecurity, information security, network security, vulnerability assessment	Information technology and services, defence and space, computer network and security, management consulting, financial services
11.	Back end developers	30	Node.js, JavaScript, Amazon Web Services, Git, MongoDB	Computer software, internet, information technology and services, marketing and advertising, financial services
12.	Chief revenue officers	28	Strategic partnerships, start-ups, Software as a Service (SaaS), go-to-market strategy, executive management	Computer software, information technology and services, marketing and advertising, internet, financial services
13.	Cloud engineers	27	Amazon Web Services, cloud computing, Docker products, Ansible, Jenkins	Information technology and services, computer software, financial services, internet, telecommunications
14.	JavaScript developers	25	React.js, Node.js, AngularJS, JavaScript, cascading style sheets	Computer software, information technology and services, internet, financial services, marketing and advertising
15.	Product owners	25	Agile methodologies, scrum, product management, software development, JIRA	Information technology and services, financial services, computer software, insurance, hospital and health care

Source: Adapted from Allana Akhtar (2020:1).

TABLE 6.2: Skills required for the Fourth Industrial Revolution.

Skill category	Examples of skills required
Workforce readiness	Literacy, numeracy, digital literacy, time management, self-presentation, professionalism, etiquette, social norms, resume writing
Technical skills	Computer programming, coding, technology-based skills (see Table 6.1), scientific tasks, mechanical functions, project management, financial management, other job-specific skills
Soft skills/human skills (cognitive skills)	Ingenuity, critical, analytical and creative thinking, ability to synthesise, complex problem solving, imagination, growth mindset
Soft skills/human skills (non-cognitive/behavioural skills)	Collaboration, adaptability, leadership, social-emotional learning, teamwork, self-confidence, empathy, cultural awareness, relationship building, emotional intelligence, interpersonal skills, adaptability, resilience, global competence, conflict management, flexibility, communication, willingness to learn new things
Entrepreneurship	Initiative, innovation, creativity, industriousness, resourcefulness, resilience, ingenuity, curiosity, optimism, risk-taking, courage, business acumen, business execution, courage, networking skills

Source: Adapted from Deloitte (2018:16–17, 49), revised and expanded by the author.

From the content in these tables it is possible to infer which skills are currently needed and will be needed moving into the future. All functions that can be digitised, especially routine-based jobs and jobs that are based on codifiable knowledge – that is all jobs that can be digitised and automated – will be embedded into intelligent machines and performed by robots. Nevertheless, people are needed to imagine, create, develop prototypes and test technological innovations (Lee et al. 2018:9). According to the WEF (2017a:8), the mere increase in the number of STEM graduates would not be enough, as additional critical cognitive and non-cognitive skills (Table 6.2) are the key drivers for the creation and delivery of value. Thus, in future a much greater value will be attached to the most human-based distinguishing factors of employees (Lee et al. 2018:9).

It follows that the common denominator for low-risk jobs is a high intensity in social and creative skills (Frey & Osborne 2015:59). Jobs that are not easily automated include jobs that require knowledge of human heuristics, and the development of novel ideas and artefacts (Frey & Osborne 2015:59). The reason is that computers cannot develop original ideas and lack the human ability to engage in complex interactions.

These skills should not only be included in the curricula of education institutions, but also be promoted and supported by business, government and individuals themselves. It is the responsibility of the individual to develop a mindset of continuous and lifelong learning.

■ Solutions and recommendations

The revolutionary effect of disruptive technologies will transform local, regional, national and international economic structures. While some industries may disappear, new ones will proliferate, resulting simultaneously in a shortage of specialised competencies and an excess of irrelevant competencies (Lee et al. 2018:3). Thus, governments, business, production systems, education and the individual will have to adapt to the changes. The ability to adapt has become a critical skill.

■ Changes in production processes and skills requirements

During the Fourth Industrial Revolution the widespread application of AI, robotics and automation, nanotechnology and material sciences is expected to substantially change existing and future production processes (Levin & Cunningham 2018:8). Apart from the demand for these specialist skills (Table 6.1 and Table 6.2), manufacturing processes will change and workers will have to be retrained. The fusion of technologies enables three shifts in manufacturing (Levin & Cunningham 2018:9).

The first shift is from mass manufacturing to mass customisation following the developments in additive manufacturing, new materials development and smarter customisation techniques. The second shift is towards mass personalisation, integrating customer preferences into purchasing, production and logistics by using social technologies and enhanced data-processing capabilities. The third shift is an increase in the use of AI to either replace or augment human cognitive activities. Therefore, production is predicted to shift from being labour-intensive to being knowledge and skills-intensive (Levin & Cunningham 2018:11).

It is recommended that manufacturers critically revise their skills needs to train and retrain current employees on a continuous basis to keep track with the rapidly changing technological environment and fill the skills gaps created by it (WEF 2018b:23). They should therefore invest in adult education.

■ Revised business models

Technological developments have affected consumption patterns. The new disruptive combinations between technology and the market enable companies to adapt their business models so as to focus on open and collaborative innovation in order to deliver improved and new products and services, to comply with customer expectations and to redesign organisational structures to deliver value (Lee et al. 2018:4).

To continue innovating, organisations should implement two main human development strategies to become more creative and resilient. The first strategy governs the techno-digital transformation and is 'concerned with the adoption and testing of technologies. The second strategy directs leadership and human development capacity by focusing on six key value drivers: experience; emotions; energy; ethics; environment; and engagement' (Lee et al. 2018:10). Most of these skills can be classified as cognitive or behavioural skills.

◼ Role of government in the changing technological environment

To accelerate the adoption of disruptive technologies by a country's industries, an enabling framework is essential. The role of the state is to create such an enabling environment, including infrastructure development and specifically information and communication technology development. The country's legal system should regulate issues that could be affected by the new technologies, such as intellectual property rights and data security. The government should invest in research, development and innovation focusing on the technologies of the Fourth Industrial Revolution to make these available at a lower cost for use by large, medium and small enterprises (Levin & Cunningham 2018:11).

A strong argument is made for the entrepreneurial role of government to substantially and directly invest in projects with a high social value (although not immediately evident), such as renewable energy, social innovation, environmental risks and the resolution of disparities among ages, regions and classes (Lee et al. 2018:8).

◼ Changes required in education

To drive the adoption and use of emerging technologies, countries will need an adequate supply of digital, technical, commercial and management expertise (WEF 2018b:22) to increase their digital competitiveness. The social capability of a country refers to the skills level of the population as reflected in primary, secondary and tertiary education (Levin & Cunningham 2018:20). The Fourth Industrial Revolution is primarily knowledge-based and continuously requires new competencies. Thus, education policies and systems need to be sufficiently agile to react to knowledge developments and redesign programmes to incorporate lifelong learning (Lee et al. 2018:9). To accomplish this, educational institutions will need to collaborate closely with

the private sector to identify and accommodate their key skills needs, while the private sector can enhance learning experiences by offering work-integrated learning or workplace learning schemes. This will contribute to a culture of lifelong learning in the workplace.

In the Fourth Industrial Revolution, many of the skills of the existing workforce have become redundant and these adults need reskilling. Adult education thus becomes critical. However, current adult learning systems are not aimed at 'systemic collective training, reskilling and upskilling' an entire workforce on a continuous basis (WEF 2017a:9). Adult learning systems should no longer be aimed at individuals or niche markets, but should, in collaboration with business, identify the current training needs to ensure employability and career security. Such adult training models can be either formal or informal, and presented face-to face or digitally, to enable self-paced autonomous learning.

A greater use of technology in education can increase the effectiveness and reach of teaching and learning through, for example, e-learning systems. The latter provides access to employees and individuals who would otherwise not have been able to acquire the necessary skills.

■ Changing environment of the individual

Technological developments have affected the lives of individuals, such as their 'consumption patterns, education, career paths, work environment, leisure time, social networks, sense of privacy and relationships' (Lee et al. 2018:4). The individual will have to develop a 'coping logic to deal with the emerging social and ethical issues relating to skills, jobs, productivity and quality of life' (Lee et al. 2018:6). Not only will a higher level of emotional intelligence be required of individuals, but also an increased degree of adaptability to a radically and rapidly changing business and social environment.

◼ Future trends

The disruptive technological development is continuous and new developments emerge daily. These, and their implications for business, government, academia and the civil society, will have to be explored. The WEF (2017a:5) recommends that 'leaders from business, government, academia and civil society develop a common, future-ready agenda on important emerging topics in order to drive change themselves and support others with their expertise'.

A comprehensive interactive model has been developed by the WEF, titled 'Strategic intelligence – Fourth Industrial Revolution' (WEF 2020:1). From this model the complexity and the far-reaching implications of the Fourth Industrial Revolution are evident. There are multiple layers/levels that are linked to the eight key themes: fusing technologies; innovation and productivity; security and conflict; disruption to jobs and skills; business disruption; inequality; agile technology; governance and ethics and identity.

One of the five dimensions of 'disruption to jobs and skills' is 'workforce and employment', which in turn unpacks into seven key sub-dimensions, such as new work models and disruption in jobs and skills. While 'new work models' include digital economy and new value creation, and entrepreneurship as two of its four sub-dimensions, disruption in jobs and skills unpacks into a further nine sub-dimensions. One of these is AI and robotics. It follows that the 'disruption to jobs and skills' has multiple facets and is interlinked with several other dimensions of the Fourth Industrial Revolution. From this model it is possible to obtain a more informed understanding of future trends in the Fourth Industrial Revolution. Future research can critically evaluate this model in order to adapt it to 'new' technological developments that would demand different technical, cognitive, behavioural, entrepreneurial and business management skills, and would have different impacts on business, education, government and the individual.

There are authors who maintain that humanity has already entered the Fifth Industrial Revolution (Levin & Cunningham 2018:18). The differentiation between the Fourth and the Fifth Industrial Revolution would need to be clarified as the debate on the extent of the Fourth Industrial Revolution has not yet been signed off.

■ Conclusion and recommendations

In this chapter, the definition of the Fourth Industrial Revolution was debated, followed by a discussion of its opportunities and challenges. Some of the technical skills required were identified, as well as the soft skills that were divided into cognitive and behavioural skills. In addition, entrepreneurial skills seem to be critical for developing and exploiting new technologies. The key implications of the Fourth Industrial Revolution for the manufacturing, business, education, governments and the individual were highlighted. The chapter concluded with the identification of some future trends.

Although the debate on the definition of the Fourth Industrial Revolution is still continuing, an inclusive definition was suggested. It follows that the Fourth Industrial Revolution can be mainly characterised by the exponential acceleration of disruptive technology. The technology can be used to serve three different roles, that of a substitute, integrator or mediator. Technology can be used to substitute employees by performing their jobs, or be integrated and become part of the employees' functions, enhancing their capacity or quality of product or service delivery. Thirdly, as a mediator, technology is a platform used by people to interface with other people, physical objects or machines (Lee et al. 2018:14). Even in cases where technological progress has resulted in the replacement of jobs, it has triggered 'offsetting market adjustments' (Bakhshi et al. 2017:15).

Government departments and programmes should increase the extent of their collaboration with business and education to strengthen the economy, governance systems and the regulatory

environment in the face of the Fourth Industrial Revolution (Levin & Cunningham 2018:13). Because business works best in a free market, business should have the flexibility to respond to the technological revolution with reduced regulation and reduced intervention by government. In this era of rampant interconnectivity, AI and robotics, government, business, education and the civil society should collaborate to design and develop a future sustainable job ecosystem (Lee et al. 2018:12).

Learning for a better future: Perspectives on higher education, cities, business and civil society[5]

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5. The author of this chapter was invited to participate as a 'guest author' with PASCAL/CENLED, for the project on 'Learning for a better future: Perspectives on higher education, cities, business & civil society'.

■ Abstract

Higher education as a universal concept is due for revision in methodology as well as philosophy. Technological innovation seems to be driving the awareness that existing models impose an extraordinary financial burden on the middle class and, in the case of South Africa, inhibit access to higher education. The current institutional model has for millennia been the universal method of transferring knowledge. This model is largely driven by public spending and delivers a standard product to the market. However, the needs of the market are dynamic and change the required outputs demanded of higher education. This involves great cost. It thus makes sense to involve actors within the economy at an earlier stage of the educational process.

The question, however, is to what extent is the 'human condition' compliant with the praxis of technological innovation, or is Artificial Intelligence (AI) and machine learning contrary to human nature? Such a question covers a very large field of research across many disciplines. This chapter will by no means pretend to answer such a difficult question and in that sense is more exploratory rather than explanatory. There might well be some degree of consensus that the human condition is set more deterministically than previously assumed and, therefore, is compliant with technological innovation in ways that not only allow for the generation of new technology but also for the more efficient use of existing knowledge. The other important research question raised in this chapter is the capacity of technologically-driven education to lower the cost of generating new knowledge and this may require new spatial arrangements for educational institutions. The complicated nature of both these variables (cost as well as spatial relocation) could be resolved by business (the economy) taking on the responsibility to realign the method of knowledge transfer.

■ Introduction

It has become a definitive axiom in the narrative on the future of higher education in South Africa to be sceptical about the capacity of the state or the political will of policy formulators to reform higher education to meet the requirements of the Fourth Industrial Revolution. James Duderstadt (1999:33) made the argument some 20 years ago when he suggested that there is a need for a new 'educational paradigm to deliver educational opportunities to a broader spectrum of humanity'. His research question assumes a connection between the 'educational paradigm' or method and humanity. His reference is not the student or the community, but humanity. This introduces the question – what exactly is the nature of humanity or the human condition?

With the reality of severe financial constraints on South Africa's National Treasury, it may well be conceivable that the state is currently in no position to take up more than a policy responsibility with regards to the transformation of higher education. National economies can reproduce the existing paradigm but the reconfiguration thereof requires a sector with a vested and immediate interest in innovation. However, sustainable policies and a prudent regulatory regime will be of critical importance to the process of rapid transformation in higher education as envisaged for the next decade (Perkins 2015). The question is, will it be feasible or realistic to expect the private sector to step into the void left by the state's financial constraints. Perhaps the ideological question that should be considered first is whether policy makers will indeed accept an amplified role for industry or private capital in the transformation of higher education. However, such a conversation is beyond the scope of this chapter.

Universities are notoriously bureaucratic and resistant to adapting to ever-evolving needs. The administrative processes and institutions through which contending narratives, ideas and research questions have to be filtered often complicate

decision-making structures to the extent that not acting becomes a feasible means of conflict resolution. At best, it slows down the implementation of best practices. Artificial intelligence and big data have an inherent validity (legitimisation bias) which assumes unspoken consensus (Jahnke & Liebscher 2019:23). Artificial intelligence identifies data patterns in order to predict human behaviour. A nominal explanation of AI is that it is a coded imitation of human behaviour. It replicates existing behavioural patterns, which seem less obvious until they become codified as a configuration. It seems that a consensus is surfacing that the way we think about education will fundamentally change over at least the medium term, but very likely even the short term. To what extent is the 'human condition' compliant with technological innovation (Wiehe 1986:88–90) and how is the human condition defined in relation to the trends in innovation?

Theoretically, the aim should be for a collaborative process between private capital, the institutions of higher education, research institutions and the state to find consensus-driven solutions to problems of inequality, disunity, inaccessibility and the exorbitant cost of education. This chapter reviews the existing higher education landscape of South Africa and then reflects on some of the main concepts typifying the conceptual range of a rapidly evolving transformative process.

■ The nature of higher education

South African higher education institutions (HEIs) are often responsible for cutting-edge research in the natural sciences, but equally so in the humanities. As a medium between secondary education and the labour market, these institutions take responsibility for the training of scholars, instilling critical review and analysis as a way of thinking, and applying both theory and best practice. With the advent of the Fourth Industrial Revolution and digitalisation, it has become increasingly important that students are provided with a cognitive institutional memory that will allow them to rapidly adapt to changing conditions and

regimes. The replication of ideas, information and knowledge as a means of education has become dated. Facts, figures and knowledge have become easily accessible at a low or no cost, and this trend will continue. Managing data and information in innovative ways has a higher premium and will become the only standard expected outcome of the pedagogic endeavour.

Over the past two decades, the countries in the developing political economies of southern Africa have weakened in terms of both their extractive and distributive capacities. In this context, the question of the role of the corporate sector to provide services, such as education, becomes more pronounced. It is often suggested that the curricula at HEIs are out of sync with the needs of an open and competitive economy. Scholars usually need an additional two to three years in which to familiarise themselves with the polarities between higher education and the realities of the labour market. The obvious point to make is that greater collaboration between educational institutions and entrepreneurs, bureaucrats and political elites will bridge the divide between the needs and outputs of the formal economy.

The question that remains is to what extent have any of these institutional actors been willing to cede authority – or share resources – to advance the greater good of higher education (Jahnke & Liebscher 2019:18). In developing political economies, the problematic of an interface between political capital (will) and social capital (trust), and the statutorily prescribed jurisdictions, constrict beneficial public–private partnerships. In South Africa, private secondary education has evolved with the exponential growth of the black middle class between 1994 and 2009, but higher education has for various reasons remained primarily within the regulatory regime of the state. To be sustainable, these educational models have to rely heavily on either the relative wealth of the higher middle class or subsidies from the national treasury.

As regards the future of higher education, the important question is, which model will lower the costs of education while

improving both the efficacy and efficiency of delivery. The answer to that may well have an impact on the organisational interface between the traditional functions of residential institutions and that of online (distance) education methods and models. But, as innovation already seems to be in the realm of the private sector, it is expected that online education will be best suited to address both the cost as well as the efficacy variables. In line with international trends, residential universities are very expensive and beyond the financial reach of the majority of the population. The transfer of skills and scholarly experience occurs in a time frame (three to five years) that challenges the immediacy of the needs of the market. The cost of the spatial displacement of students promotes economic elitism, and education becomes the pursuit of the privileged. Most, if not all, universities in South Africa exclude large numbers of students because of a lack of capacity (limited places available) rather than applying scholarly measures. In 25 years, only two public universities have been added to the pool of higher education options. South Africa has fewer universities per 100 000 people than its peers in developing political economies. Accessibility might be the definitive feature of online education.

■ The anomaly of residential institutions

Historically, residential institutions defined higher education. Prospective scholars migrate to an unfamiliar location, conform to a historicity where tradition and intergenerational rituals are honoured, if not romanticised, and conform to a practiced by repetition, historical pedagogic ritual. The independence of theory and thought is sacrosanct and insulated from commercial interests by an uncodified set of normative moralities. The notion of spatial separation between the needs of society or the economy and that of HEIs are venerated as notoriously abstract but fundamentally necessary to avoid the contamination of ideas. Of secondary concern is the question of whether these ideas

should have at least a nominally utilitarian value for the survival of civil society.

Of necessity, tradition, culture and social values are offended by modernity, but the ever-evolving or changing conditions of human existence also induce a Darwinist natural selection. The evolutionary inevitability is most likely to be disturbed by human error. The intergenerational, cultural secularisation of social life and the commercialisation of the greater good, progressively corrode the justifications for the 'uncodified moralities' of a displaced existence at institutions of higher education. Instead of prospective scholars conforming to the historically embedded rituals, values and rules of such institutions, they impose the modern ideals of accountability, oversight and codified regimes on residential, educational institutions.

The distance between the needs of society, the interests of the economy and the institutionalised pedagogic ritual is, therefore, pliable and varies or evolves. The cost of this separation accumulates at the expense of modernity, economic development and the fusion between the human condition and innovation (Wiehe 1986:93). The spatial separation between the residential institution for higher education and prospective scholars of innovation is a burden upon the distributive regime of the state, the material health of society and the interests of a modernising economy. The total cost of locating a scholar at a residential university, which includes tuition fees, accommodation and logistics, could reduce the financial security of a typical middle class family to that of the working class.

In the United States of America, the debate about the erosion of the demographic dividend of the middle class, as a consequence of the cost of higher education, has been central to the national discourse on political and economic rights for more than a decade ('The middle class struggle to pay for college' 2019; Warren, Baum & Sitaraman 2007:n.p.). In South Africa, the #FeesMustFall movement was conceived because of the burden of the cost of higher education on the black middle class. The black middle

class of South Africa is largely a first-generation socio-economic phenomenon and access to assets and capital is a post-1994 feature of their economic and financial condition. If one child per family leaves home to attend an institution for higher education in another part of the country and sets up residence, a second habitat is created at the expense of the family's middle class income. This can potentially impoverish a whole class of formally employed people. As suggested by an Africa Check research review ('Factsheet: Measuring South Africa's (black) middle class' 2018), being the first-generation middle class, the likeliness of falling back into poverty is abnormally high because of limitations in the demographic dividend of the class, but also because of the extremely high unemployment levels of 30.1% in the South African political economy (as reported by Statistics South Africa 2019).

The #FeesMustFall movement started as a middle class revolt against exorbitant tuition fees at South African universities. The suggestion was that high tuition fees exclude poor students from access to the top educational institutions, and create a *missing middle* (class) of scholars who are excluded from the R111.2 billion allocated by the government for free education. The violence associated with the movement might have been questionable but the socio-economic origins of the revolt are real.

■ The public, higher education sector of South Africa

In 2019 more than 417 000 students applied for state assistance through the National Student Financial Aid Scheme of the DHET, of which approximately 300 000 applications were approved. Of these about 40% could be described as the 'missing middle', a term that refers to households that, on a combined basis, earn less than R600 000 per annum, and are therefore not in a financial position to afford tuition, accommodation and the logistical expenses of higher education at residential universities. Households in the range of a combined gross annual income of between R150 000 and R600 000 per annum can be defined as

middle class. However, once the net income is calculated and the approximately R200 000 for educational expenses per student is deducted, most of these families become part of the missing middle, that is households with a working-class income. At R600 000 per annum, most families are unable to qualify for financial aid from the state but they are also in no position to pay the educational fees of their children. It is estimated that 40% of all students form part of the so-called missing middle (South African Market Insights 2019; The Skills Portal 2017).

South Africa currently has 26 public universities providing higher education to approximately 1 million students. This is more than double the approximately 500 000 students registered in 1994. In 2020, 200 000 of them were first-year undergraduate students. More than 50 technical and vocational education and training (TVET) colleges accommodate the scholarly interests of a further 700 000 students, up from 200 000 in 2000. According to South African Market Insights (2019), private HEIs provide for another 90 000 students. The distance education university, Unisa, had 380 000 students in 2019, which makes it South Africa's largest higher education institution. Media reports correspond with a public narrative of administrative weaknesses that have serious reputational consequences for Unisa. Thirteen South African universities made the list of the top 1300 universities compiled by the Centre for World University Rankings. The University of Cape Town (229), University of the Witwatersrand (317), University of KwaZulu-Natal (349), Stellenbosch University (421), University of Pretoria (459), University of Johannesburg (655) and North-West University (808) may well be South Africa's highest-ranked HEIs (Government Communication and Information Systems n.d.; 'South Africa's education statistics' 2019).

The standard criteria for rankings are quality of education, alumni employment, quality of faculty and research performance. With regards to research performance, the research output, high-quality publications appearing in the top 10% of rated international journals, the international influence of such chapters and the

number of citations of research chapters in the top 10% of journals, set the standard. For purposes of 2019/2020, the methodology and weighting were adapted to provide for equal 'emphasis' on the 'learning environment and research' (CWUR 2019). However, all South African universities seem to gradually lose territory to other international institutions, with funding seemingly at the heart of the problem.

The traditional funding model of South Africa's public HEIs is highly reliant on varying weighting between state subsidies and student fees. The actual subsidies to be transferred to each university are specified in the 2019 *Appropriations Act*. The institutions share 36.7 billion in direct subsidies and so-called block allocations, divided using a complex set of formulas. In 2019 the range of subsidies per student was between R647 000 to R21 000. Start-up and specialised institutions received a greater share of the budget and Unisa received the least of all institutions from the state. Rhodes University received R80 000 per student Walter Sisulu University received R37 000. The new University of Mpumalanga received R650 000 per student (1600 students) and the Sol Plaatje University (1500 students) received R620 000 per student. The last two universities were established in 2014 and much of the costs or subsidies will be allocated towards infrastructure development and general operations. The Sefako Makgatho Health Sciences University (formerly Medunsa, was created in 2015 when it separated from the University of Limpopo) received a subsidy of R144 000 per student.

It is evident from the above that the state largely takes on the responsibility for higher education, including the funding and regulatory regime. This system is currently under immense pressure because of rapidly increasing budgetary constraints and South Africa's escalating debt to GDP ratio (exacerbated by the COVID-19 pandemic), but also the financial burden on the middle class because of a persistent low growth trajectory in the South African economy. The impoverishment of the working class equally inhibits intergenerational or inter-class mobility as the

demographic dividend of whole classes of people is depleted by a contraction in economic opportunities.

It seems obvious that the existing higher education model is not only expensive and socially disruptive but that a completely new way of thinking about the transfer of knowledge is required. Creating new knowledge is fundamental to innovation. The question is, how compliant is the human condition, our instinctive cognitive configuration, with innovation. The social behaviour of those who were conceived and grew up in an era of digital technology might well guide where the future of higher education is heading towards.

■ The human condition and the absence of free will among 'digital natives'

The contemporary generation of so-called 'digital natives' has been brought up on a staple diet of digital technology. The curious feature of such individuals is the seemingly natural compliance of their behavioural instincts with the rhythm and rhyme of the digital revolution. It remains a contested theory whether the human condition precedes technological innovation in time or vice versa (Wiehe 1986:93). For purposes of education, the question about free will arises. Sam Harris (2016:56) postulates the hypothetical question: are humans the authors of their thinking? The answer has to be an emphatic no. To come to such a conclusion, it is important to distinguish between free will and individual choice. If we are not the authors of our minds or thinking, we are also not the authors of the choices we make. The sense of a self is therefore illusionary and the brain acts as a reservoir for genetic dispositions and evolutionary traumas captured in the reptile brain. It is very likely that the question of whether humans indeed have free will is also related to answers about the most fundamental traits of the human condition. Of course, the assumption is that the human condition has universal traits that

are fused and merged as a result of the evolutionary experience of all homo sapiens. In social sciences, determinism has historically been frowned upon as contrary to the necessity of a sceptic scholarly disposition. The sceptic weighs dispositions against a set of observables or measurables and uses rational choice to come to conclusions (Harris 2016:88; Mozes 2013).

Determinism is the most conspicuous attribute of algorithms and scientific theory (Jahnke & Liebscher 2019:23). Determinism is the assumed unscientific doctrine that states that human behaviour is determined by discernible causes preceding the will of the individual. These causes are operative, similar to cumulative and repetitive trends of machine learning. It is thus tempting to draw methodological analogies between the maxim of determinism and machine learning. Based on this, it is possible to make the presumptuous postulation that technologies such as AI and machine learning are not only compliant with instinctive human behaviour but also compliant with the human condition. No doubt such a contention will be thoroughly challenged, but it certainly is a hypothesis worth critical scrutiny.

■ Technological innovation and the human condition

The fact is that technology obscures the obvious distinction between humans and the natural world. The suggestion that with the introduction of technology (AI and machine learning) we enter a post-human world of social existence can only be true if it is proven that the human condition is contrary to, or in conflict with, the replication of best practice brought about by technological innovation. This allows for a whole new field of intellectual and philosophical exploration. It raises some serious ethical questions about the relational tissue between humans and the natural world and, for instance, what the assumed uniformity does to the individual's experience of the 'purpose of life' questions. But, at the simplest level, it is worth considering who owns the data, who gains from outcomes and at whose

expense are the outcomes gained, and is privacy protected? Media reports surface regularly about data harvesting aimed at influencing human needs and behaviour. The narrative of Russian involvement in the presidential elections in the United States is one example. The simulation and stimulation of costly artificial needs is another example of questionable ethics, whether it appears in the market of goods and services or the market of ideas. These are all ethical considerations that come about because of technological innovation.

The validity and reliability of data cannot be settled before a thorough process of review, and the confirmation of the legitimacy of the process or methodology which preceded excavation of the data. Once these questions are settled through sufficient consensus, the broad application of open data in the learning process can start. The real value of authenticated data is in the sharing thereof across vast and complicated spatial realms. Open data create a cooperative environment binding individual with collective intellectual pursuits (Perkins 2015). From a managerial perspective, it legitimises the systemic outcomes of codifications and it optimises data, information and knowledge. Open data and the utilisation thereof by a large number of scholars and researchers inaugurates a complicated network of individual minds pursuing the vices of the greater good or best practice.

Microsoft University[6] is one example of a managerial trend embedded in the needs of fast-changing, modern economies. In May 2020, Stadio Holdings,[7] a private, higher education model in South Africa that originated from the business model of the PSG Group, expressed an interest to pursue a similar methodology as part of its involvement in higher education. Short courses and technical workshops will provide for technocratic hubs of innovation, but they also facilitate training for IT administrators and developers. These courses and workshops focus on systemic

6. See https://www.microsoft.com/nl-nl/microsoftuniversity.

7. See https://stadio.co.za/.

problems and solutions by sharing experience through highly interactive methodologies. While such a methodology is more often best suited to the exchange of ideas in technical disciplines, it is also worth pursuing as a teaching and learning experience in the social sciences. Pre-recorded lectures and scholarly readings could be uploaded on software sites and the learning experience shared via group discussions.

The technology is readily available, but in South Africa progress in this regard is primarily obstructed by the inaccessibility and/or cost of high-speed data, as well as the ideological reluctance of the government to allow for greater private-sector involvement in a time-honoured system of state control. Access to high-speed data as a means of transferring knowledge broadens the learning experience for scholars, and as a matter of principle, these institutions cooperate (horizontal reach) with similar or like-minded institutions to deliberately complicate (vertical reach) the quality of solutions required or envisaged. Singularity University,[8] for instance, markets itself as reaching out to a 'global learning and innovation community using exploring exponential technologies' in pursuance of addressing universal problems (su. org.). In these times, innovation is not a lab activity and neither does it emanate from the genius of the isolated mind.

Innovation in relation to adapting or changing the architecture of information transformation could be pursued as an institutional endeavour at all levels of teaching and learning. However, scholarly innovation is less likely to occur at the undergraduate level because the teaching of most of these programmes is often reminiscent of a historical methodology that has been heavily reliant on the transfer of knowledge as opposed to the scholarly management of information. The accessibility of large data sets and information (knowledge) wear away the value of memory as a means of merit (Perkins 2015). Recollection as a tool to access knowledge and information used to be an invaluable asset.

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8. See https://su.org/about/.

The emphasis, however, has shifted to the complexity of cognitive analysis. It is not *what* you think, it is *how* you think that adds value to the scholarly endeavour. The reality is that the institutional transfiguration from a knowledge-based education to a scholarly experience, which rewires the cognitive process as well as the institutional memory of that process, requires a rather substantial intervention from authorities. There is no evidence that such a transfiguration is necessarily resisted at the level of political will. However, inevitably such an imposition will be disruptive at the individual level as well as the institutional level of analysis. The question is, is it possible to initiate a sufficient impact in a constrained economic environment?

■ Transfiguration: The diffusion of innovation

South Africa has not recovered from the international economic contraction of 2008/2009. Since then, state spending has been under immense pressure because of inefficient spending (distributive regime) and state capture, but also as a consequence of challenges in terms of compliance with the state's extractive regime. In more affluent societies or countries, whether democratic or not, the implementation of a transfigured scholarly system may well be imminent, while in weak economies the process may lag behind the norm of more affluent and well-managed political economies. It is also likely that a revised scholarly system will be accessible to middle class communities and exclude the working class or impoverished societies. Such a pattern of accessibility might have measurable consequences for the state in contracted political economies.

All new knowledge originates in a research question, and it will be no different in a transfigured scholarly system (see Figure 7.1). The question is being investigated (cognitive complexity) and the information and data that are excavated or extracted are managed with the application of algorithms to establish
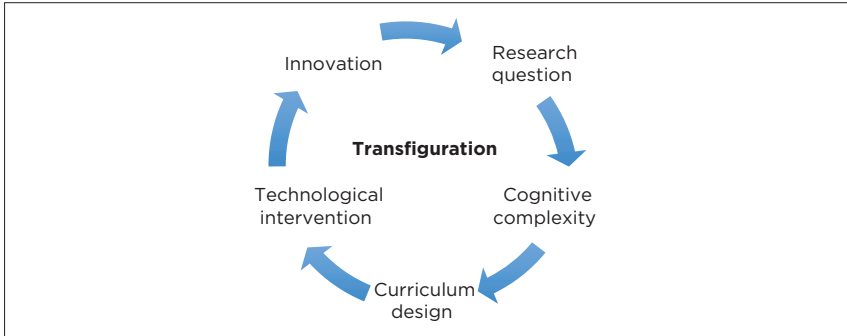
FIGURE 7.1: The research process.

behavioural or mathematical patterns. Based on this, the curricula are designed and become the basis for technological interventions, which precede innovation (new knowledge that answers the research question).

The cooperation between the private economy and universities at the level of institutional change may well include curriculum design. Curricula will have to be redesigned as a precondition for technological adaptation. Technological interventions provide the algorithm that imposes the predictability and the architecture of innovation. Such an algorithm is subject to revision if the variables it includes are selected, however carefully, by the researcher. But, if the equation (algorithm) is populated by custom recognition software, such as machine learning or AI, IT systems will predict solutions by distinguishing bad practice from best practice. Populating the algorithm with the appropriate variables relies fundamentally on systems that will identify constructive (behavioural) repetitions, based on data sets or behavioural trends, which then optimises the algorithm and develops independent, best practice solutions.

The transfiguration process and the resulting outcomes probably reduce human error in terms of the pedagogic endeavour, but it raises complex questions beyond the scope of this chapter about accountability as a regulating feature of

social change. In many ways, the programmer or coder, the individual or interest group who assumes the relational tissue between variables within the equation, could be the source of human error with accountability largely measured in monetary terms. However, solutions to very human problems – or misunderstandings – often surface only once large quantities of data are managed to express or confirm relationships between variables. The relational tissue between variables is complicated by the magnitude of varying relationships and the multiplicity of inconspicuous constants.

The assumption is that if such a transfigured educational system becomes operative at the same cost as the knowledge transfer practice, it will reinforce existing inequalities. However, it is the historical practice of technology to increase quality while lowering cost, which is the real strength of the motivation for transfiguration. It is thus possible to include marginalised individuals and societies at the expense of the Treasury at a minimum cost, but it is also more possible for the private economy to grant broad access to the benefits of technology at an inconsequential risk to its calculated profit margin. Entrepreneurs have a vested interest in social stability and socio-economic mobility, and the accessibility of technological or scholarly innovation serves society, the state, as well as the interests of economic actors.

A recent study by Rand Corporation (Silberglitt et al. 2006:1) reviewed the factors that could 'influence the potential of a technology revolution' in several pre-selected countries. As part of the study, 56 technology applications were identified which could potentially impact new educational models. A selection of countries, including South Africa, were reviewed in relation to 10 social and cultural variables that can act as 'implementation drivers and barriers' (Silberglitt et al. 2006:1). The aim is to assess the capacity of these countries to acquire, but also implement, a selection of 16 applications in its educational models.

The horizontal axis of Figure 7.2 indicates the 10 factors (percentages) that appear to be barriers to technology implementation, reflecting on the capacity of selected countries to implement the 16 illustrative technology applications. The vertical axis reflects the factors that act as drivers (percentages), multiplied by an index of the capacity of the technology applications.

Figure 7.2 makes it clear that America, Western Europe and East Asia are highly compliant with technological innovation and that this extends to the educational sector. China and India emerge as technological powers but massive inequality
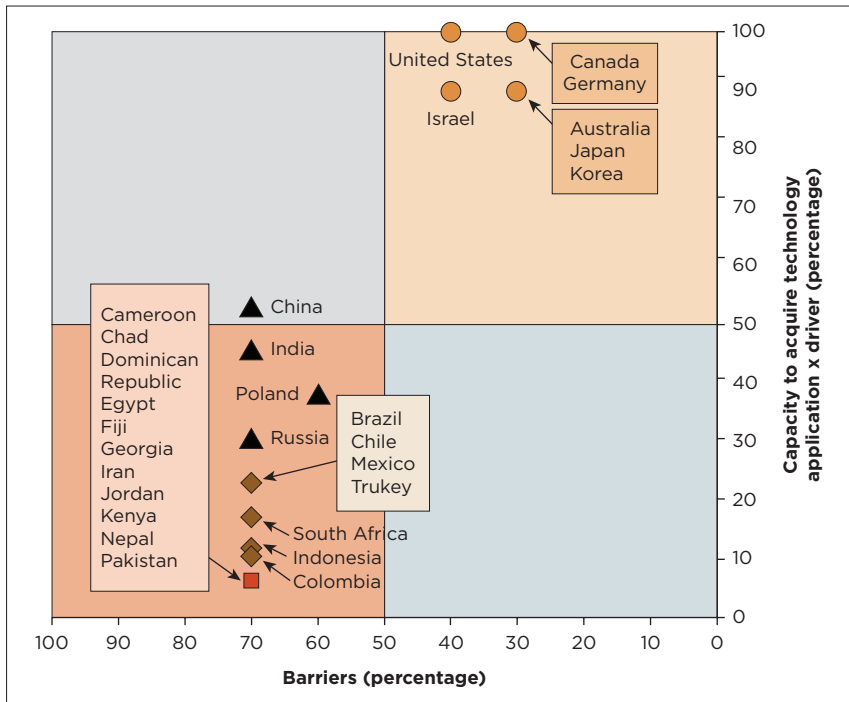
Source: Silberglitt et al. (2006).

FIGURE 7.2: The capacity of selected countries to implement the 16 illustrative technology applications.

impacts accessibility and cost. Eastern Europe in general and Poland in particular are catching up fast, but they are still behind China and India as emerging technology powers. Russia seems to be dragging for reasons of policy instability and inadequate resourcing which account for the relative slippage of Russia as a technological powerhouse. Latin American countries, Turkey and South Africa are way behind the scientifically developing countries because they are disadvantaged by the indices of barriers and the capacity to implement. Perhaps the most important finding of the study, for this chapter, is that 'a country having the ability to acquire and implement a technology application would not necessarily do so, unless it was motivated by national or market needs' (Silberglitt et al. 2006:2).

■ Technologically enabled educational programmes of the future

At this stage, it is not possible to predict with any certainty the nature of the technologically enabled educational programmes of the future. For the immediate future, the scholarly experience may not yet be in the form of a hologram. It should, however, not be ruled out as a futurist feature of lecturing or tools for the transfer of knowledge. What could be in the immediate or short-term future, as foreseen by Open University Innovation Reports, is 'intelligent tutoring systems, dialogue-based tutoring systems, exploratory learning environments, automatic writing evaluation, and conversational agents' (Kukulska-Hulme et al. 2020:3).

It is almost impossible to envisage the complete architecture of the educational experience of the future, mainly because of the indefiniteness of technological innovation and the plasticity of human and cognitive evolution. With this in mind, the following could be some features of a technologically enabled curriculum of the foreseeable future:

- During the orientation year, the basic concepts of subject matter and the relational tissue between these concepts are reviewed; introduction to complexity as a feature of skills development and competency; micro, focused programmes which are skills/competency-based, with competency referring to the ability to apply skills.
- Inclusion in an interactive social network is not necessarily personal with the student determining the curriculum content and selecting co-students on the journey. The architecture of the network is fixed but subject to minor adjustments by members of the network. The internet of things is an established technological configuration of interconnected computing devices for sending and receiving data.
- Learning is around a menu of interests, either defined by the individual before joining the social network, by the network or by compliance with the dictates of AI and machine learning.
- The role of higher education is to formalise the processes and procedures to provide access to large-scale technology. The technology evolves with future preferences and vice versa.
- Working and learning become a mutually interchanging dynamic and application is the nature of the workplace, but learning is the result of problem-solving experiences. The site of labour is permeated by a culture compliant with the requirements of a gig economy. Commissions are bound by time, complexity and quality of output.

It is necessary to consider the AI architecture aimed at supplementing the skills of the lecturer or teacher as well. It might be slightly more complicated to codify creative thinking, the unpredictability of creativity or the collaborative process. The codified tools of AI aimed at enhancing the learning experience of the scholar are introduced to the process by the teacher.

■ Conclusion and recommendations

South Africa's HEIs are generally rated as competitive, innovative and are still relatively well resourced. However, the need to change the funding model of these institutions is critical to make provision for long-term cycles of low economic growth, a decline in the material conditions of the middle class and adverse budgetary provisions. Most of these urgencies relate to the challenges of the prevailing socio-economic conditions. Approaches to the reinvention of the teaching and learning experience, such as conventional interventions to stimulate economic growth, the policy-driven allocation of resources and access through the budgetary reallocation of scarce capital, may well be ineffective and even archaic.

The real question is, how do we increase quality and broaden access while lowering the cost of education? The answer seems inevitable – increase the use of technology. Machine learning and AI may well be comparatively compliant, not only with human behaviour but also the human condition. The human condition relates to the architecture of the mind and the intellectual origins of free will. The question is, to what extent is there a similarity in envisaged outcomes between human behaviour and machine learning. The idea is not to equate the human mind with the coded results of machine learning, but rather to suggest similarity in a methodology, which allows for intelligent prediction.

The cultural and social impediments to technology as a means of generating new knowledge need to be researched further. These impediments, however, might also be a barrier to how existing knowledge is transferred. This, however, is a policy matter and should be addressed through cooperation and consultation between stakeholders in the economy, bureaucrats and policymakers. Technology presents a real opportunity for greater equality but unless these impediments are managed, technology and its advantages for the transfer of knowledge will just further

deepen the inequalities in South Africa. It must be obvious that the fragilities of the middle class demographic dividend impact heavily on both the cost and accessibility of higher education. In a transfigured, technologically-driven system, both the burdens of cost and accessibility could be addressed, securing the sustainability of the demographic dividend of the South African middle class. The process of learning will, most likely, not result in a redesign of curricula, but technology may eventually determine both the value and validity of knowledge, as well as initiate the creation of new knowledge.

Rethinking the post-school education and training system to prepare the workforce for the Fourth Industrial Revolution world of work

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◼ Abstract

The Fourth Industrial Revolution, together with COVID-19, has forced countries across the globe into a new reality that has 'fundamentally (altered) the way we live, work and relate to one another. In its scale, scope and complexity, the transformation will be unlike anything humankind has experienced before' (Schwab 2015). Within this context, the chapter investigates the implications for preparing the workforce for the new world of work, and the need to rethink and redesign elements of South Africa's post-school education and training (PSET) system. The chapter analyses the impact of the Fourth Industrial Revolution technologies on job losses and the creation of high-skill jobs for which the current and new workforce will need to prepare. The chapter reviews some of the predictions by the WEF, ILO, the World Bank and other organisations that are researching the changing nature of work and the Fourth Industrial Revolution workplace, as well as the skills needed for a productive workforce in this work context. The increase in informal work arrangements in the 'gig' economy is explored, with specific reference to employer–employee relationships, occupations and the fluidity of job roles. More work is being done in multi-disciplinary, cross-functional teams cooperating in temporary, virtual work relationships.

This chapter presents the view that these changes require a fundamental rethink of the systems, processes and practices relating to the occupation-directed education and training programmes offered by public and private entities in the PSET sector. These consist of universities, universities of technology, skills development providers and colleges offering technical and vocational programmes. The proposed changes are described in terms of their relevance for preparing the workforce for the Fourth Industrial Revolution world of work.

◼ Introduction

Since the WEF brought the Fourth Industrial Revolution into the global discourse at its annual meeting in January 2016 in Davos-

Klosters, Switzerland, COVID-19 has catapulted South Africans and much of the world into the Fourth Industrial Revolution and both are contributing to the rapidly changing workplace. Arthur Goldstuck (2020) believed that COVID-19 will accelerate this revolution by forcing the business and education sectors to 'embrace many of the tools that will drive this revolution' and the virus will provide a global case study of the Fourth Industrial Revolution in action.

Klaus Schwab (2015), executive chairperson of the WEF, describes the Fourth Industrial Revolution as a transformation unlike anything humankind has experienced before:

> We stand on the brink of a technological revolution that will fundamentally alter the way we live, work, and relate to one another. We do not yet know just how it will unfold, but one thing is clear: the response to it must be integrated and comprehensive, involving all stakeholders of the global polity, from the public and private sectors to academia and civil society. (n.p.)

The Fourth Industrial Revolution and COVID-19 have forced the world into a new reality, a 'new normal' that demands the re-examination of many of the long-held beliefs about work, the workplace, jobs, employment and how workers interact with colleagues in virtual 'offices'. The impact that the Fourth Industrial Revolution and the virus has had in these areas also demands a rethink of deep-rooted beliefs, attitudes and models on how to prepare the workforce for a new world of work.

This chapter focuses on the PSET system and more specifically, occupation-directed training for the new workplace. Some of the key changes in the world of work will be explained. The PSET system needs to change if it is to succeed in preparing the current and future workforce for the new world of work. The system has the responsibility to serve industry with demand-driven training programmes offered by public universities, universities of technology and TVET colleges, as well as a large number of private HEIs and colleges. This chapter does not address changes required in the more academic qualifications offered by these institutions or changes required in the basic education system.

However, these institutions should participate in debates, such as UNESCO's Futures of Education initiative, on how knowledge, education and learning need to be reimagined. The future of humanity and the planet need to be reshaped in order to confront a world of increasing complexity, uncertainty and precarity.

The 2018 WEF future of jobs research report identified the following five characteristics of the future of jobs:

1. Automation, robotisation and digitisation will be different across different industries.
2. Significant job disruption will be accompanied by an overall positive outlook for jobs.
3. There will be a rapid shift in the division of labour between humans, machines and algorithms.
4. The demand for new skills will be driven by new tasks in the work environment.
5. We will all need to become lifelong learners (Ratcheva & Leopold 2018).

In relation to this, the PSET system, tasked with preparing the workforce for future jobs, will have to take these five points into account.

■ The impact of the Fourth Industrial Revolution and COVID-19 on jobs

■ The impact on job losses

Most research on the impact of the Fourth Industrial Revolution predicts large-scale job losses. A 2016 World Bank Development report estimates that 67% of jobs in South Africa are at risk from automation, with the following examples for other countries: 69% in India; 65% in Nigeria; 35% in the UK; 47% in the USA and 77% in China. A *Financial Times* article (Bland 2016) describes a factory in China where nine robots do the work of 140 full-time workers. An economist in the article states that some countries in parts of Asia and Africa will struggle 'to create sufficient

manufacturing jobs before they are wiped out by the gathering robot army in China and beyond' (Bland 2016).

News reports on the impact of COVID-19 provide alarming statistics of large-scale job losses across the world as businesses were shut down for months as a result of the first action to curb the spread of the virus. For example, in the period February to May 2020 the official unemployment rate in the United States of America increased from 3.5% to 13.3% (US Department of Labor 2020).

In a radio interview on 23 June 2020, South Africa's statistician-general reported that 16.4 million people were actively looking for a job but without success, even before the impact of the lockdown that started on 27 March 2020 (Capetalk 2020). At the end of the third quarter of 2020, South Africa's expanded unemployment rate, which includes discouraged work seekers, had reached 43.1% (Statistics South Africa 2020). In a briefing to committees of Parliament on 28 April 2020, the National Treasury presented a possible a worst-case scenario in which more than 7 million jobs could be lost to push South Africa's unemployment rate to over 50% (News24 2020). The Institute for Futures Research at Stellenbosch University warned of an increase in unemployment if the macro-economic environment is not improved: 'the rate of growth in job creation will fail to match the growth rate of the economically active population. This implies pervasive and structurally high levels of unemployment' (NEDLAC 2019:50).

Even as the COVID-19 restrictions are lifted and all businesses become fully operational, it is unlikely that the employment rate will improve to reach the pre-lockdown figures. After the significant financial losses that business suffered through the lockdown, businesses will try to keep their doors open with less but more productive staff. A positive spin-off of the lockdown is that some businesses managed to remain at least partially operational by working smarter with the staff who had access to technology and the internet at their homes. Many of these

businesses are likely to adapt their business practices after experiencing the benefits of staff working remotely. Decisions to move business from large central offices (even partially) to home-offices will contribute to job losses among cleaning, security and other staff who were employed to service offices. The reduction of staff in South African business will also impact on the work placement of students to complete their academic programmes, as will be described later in the chapter.

■ Reconfiguration of jobs and new high-skill level jobs

There is wide-ranging agreement on the statement by WEF and Kearney (2018:22–23) that new jobs will be created as a result of the use of Fourth Industrial Revolution technology, particularly at the high-skill level. While the WEF recognises the disruption of the Fourth Industrial Revolution to many jobs, it predicts the creation of a wide range of new jobs in fields such as STEM, data analysis and computer science. The demand will be for professionals who can blend digital and STEM skills with traditional subject expertise, and 'combine deep knowledge of their industry with the latest analytical tools to quickly adapt business strategies' (WEF 2017:9).

These predications are particularly concerning for South Africa where the majority of the current workforce is not adequately skilled for such specialised jobs. In addition, one of the challenges in preparing the youth for these jobs is the low achievements in the basic education system as confirmed by the 2015 Trends in International Mathematics and Science Study that rated South Africa's Grade 9 learners in science and maths as last and second to last, respectively, out of the 39 participating countries (Letaba 2017). The WEF report on the future of jobs in Africa warns that the interaction of the Fourth Industrial Revolution with various socio-economic and demographic factors affecting the region will result in 'major disruptions to labour markets, growth in wholly new occupations, new ways of

organizing and coordinating work, new skills requirements in all jobs and new tools to augment workers' capabilities' (WEF 2017:9). In a later report, the WEF conceded that automation had not yet resulted in massive job losses, but that it will result in 'reallocations of employment between tasks, sectors and regions' and recommends that organisations should distinguish between jobs that will be gradually reconfigured and those where there is a risk of sudden disruption (WEF & Accenture 2019:14).

■ The 'jobless' economy and the 'useless class'

Predictions about the 'jobless' future by authoritative institutions add to the challenges anticipated in the Fourth Industrial Revolution workplace. The World Bank (2019:20) raises concerns about the 'advent of a jobless economy' as many tasks that were traditionally performed by humans are being taken over by robots, or are at risk of being replaced by robots that are enabled by AI. The WEF warns that if the prediction about large-scale job losses because of automation comes true 'we are indeed headed for a jobless future' and it is therefore important to engage in policy discussions on how to prepare for this future (Chakhoyan 2017).

Even before the impact of the Fourth Industrial Revolution, large-scale closure of businesses and the devastating loss of jobs because of the virus, Harari (2016) predicts:

> [*T*]he creation of a massive new unworking class: people devoid of any economic, political or even artistic value, who contribute nothing to the prosperity, power and glory of society. This 'useless class' will not be merely unemployed – it will be unemployable. (p. 370)

These predications are particularly daunting for South Africa where there is already a large number of unemployed, unemployable and low-skilled workers. Many of them will probably not have the skills required for the meaningful work opportunities in the Fourth Industrial Revolution workplace that will enable them to earn a decent income. The socio-economic impact of the Fourth Industrial Revolution falls outside the scope of this chapter, but it will require

proactive and creative public and private initiatives such as the Presidential Commission on the Fourth Industrial Revolution that was announced by President Ramaphosa on 07 February 2019.

■ Changes in the nature of work and work relationships

■ The new 'workplace'

In order to understand the changes required to prepare the workforce for this new workplace, it is important to recognise that the 'workplace' has changed significantly. According to Diana Vienne (2020):

> As a result of the coronavirus, the workplace will never be the same. Even the word 'workplace' suddenly seems obsolete, as the physical location in which we now work has merged with the places in which we eat, sleep, learn, exercise, and play. (n.p.)

This section describes some of the features of the new 'workplace' that countries are already facing – or will be facing – as a result of the devastating impact of the virus combined with the Fourth Industrial Revolution's 'Disruptive technologies: Advances that will transform life, business, and the global economy' (Manyika et al. 2013)

■ The changing nature of work and shifts in employment relationships

The Deloitte framework for action to prepare the workforce for the Fourth Industrial Revolution describes the rise of the 'gig' economy and explains that it is characterised by a blending of the formal and informal economies (Deloitte 2018:40). In this economy, a larger proportion of the workforce will be involved in alternative, non-traditional and flexible work arrangements, for example in the form of short-term contracts or freelance work. These workers will not be earning a regular salary, but will be paid for each 'gig' they do, such as Uber car drivers. The Deloitte

research found that companies in the formal economy are increasingly hiring 'gig' workers as they rethink what skills and roles should be brought in-house versus skills that can be contracted. As the 'gig' economy grows it can provide youth with alternative ways to generate income. It will also reframe what a career looks like and provide new areas in which to achieve employment goals (Deloitte 2018). The 2018 WEF survey confirms the Deloitte research; it found that – depending on the industry and geography – between half and two-thirds of companies are likely to address their skills gaps by making use of temporary staff, external contractors and freelancers (Ratcheva & Leopold 2018).

Barrios, Hochberg and Yi (2020) state that smartphones and related technological advancements have provided consumers with new ways to access the retail market and made it easy for workers to find flexible work opportunities. A good example of this is the M-Pesa service launched in 2007 and available in several African countries, which provides a money-transfer and micro-financing service via mobile phones. It provides access to financial services for millions of people who do not have or need a bank account. This facility provides small entrepreneurial enterprises in the informal economy, such as small-scale farmers, spaza shop owners or clothing alteration businesses, with access to virtual banking services on their cell phones for the instant processing of transactions at minimal cost (Vodacom n.d.).

The ILO (2015:13) confirms the changes in the nature of work and found that 'nearly six out of 10 wage and salaried workers worldwide are in either part-time or temporary forms of wage and salaried employment'. These changes are accompanied by a shift in employment patterns. The growing group of informal, temporarily contracted and 'gig' workers who are empowered by Fourth Industrial Revolution technology, will be working in impermanent relationships in cross-functional project teams, and collaborating through virtual communication across organisational boundaries and time zones. This will require adjustments to

contractual arrangements, as well as new skill sets for both the 'employer' and 'employee' to effectively negotiate, maintain and exit such temporary working relationships.

Most of the current occupation-directed programmes offered in the PSET sector are aimed at the formal economy; preparing new entrants for employment and upskilling workers who are already employed. The programme offerings will need to be revised in order to equip workers in the 'gig' economy to pursue a wider range of work experiences, including working for numerous 'employers' at the same time (Hagel, Schwarz & Bersin 2017:38).

■ Changes in occupations, job descriptions and career paths

Davies, Fidler and Gorbis (2011) foresee that multiple careers will become commonplace and this will require organisations to rethink and create more diversity and flexibility in traditional career paths. Deloitte also warns against the perception that the Fourth Industrial Revolution will not significantly change current jobs and occupations (Engelbert & Hagel 2017):

> If you're training people for a job that's already been invented, or if you're going to school in preparation for a job that's already been invented, I would suggest that you're going to have problems somewhere down the road. (p. 102)

One of the main characteristics of the future of jobs is the shift in the 'division of labour between humans, machines and algorithms in the performance of tasks' (Ratcheva & Leopold 2018):

> Currently an average of 71% of total task hours across the industries are performed by humans, compared to 29% by machines or algorithms. By 2022 this average is expected to have shifted to 58% task hours performed by humans, and 42% by machines or algorithms. (n.p.)

Even the tasks that are mainly performed by humans today, such as communicating, interacting, coordinating, managing and

advising, will, to a lesser degree, begin to be taken on by machines (Ratcheva & Leopold 2018).

Box 8.1 provides some examples of changes in occupations identified during the WEF's future of jobs survey (Centre for the New Economy and Society 2018:9). However, the WEF foresees that some changes will occur more gradually than others (Centre for the New Economy and Society 2018:14), and there are likely to be differences in the pace of change across industries and countries.

Organisational structures in the future workplace will evolve from the more traditional hierarchies to networks of teams that work across the boundaries of individual organisations and where creative work is done by small, diverse workgroups that connect with each other in more flexible work relationships (Hagel et al. 2017:40). This will require organisations to reconsider the meaning of the concept of a 'career' and to explore multi-role, flexible career paths in which ongoing learning will be essential (Rea et al. 2017:192).

Many employees, especially in smaller organisations, already perform functions that cut across occupational boundaries. For example, one person in a furniture upholstery business could perform the job functions of the human resources manager, payroll clerk, stock control officer and customer service manager. People's relationships to occupations are also less rigid now than they were even 10 years ago. In the past, individuals were trained for a specific occupation where they spent their working life. Many people now move flexibly between roles that were traditionally linked to specific occupations. In many cases, the job roles are unrelated to the qualifications that afforded their initial entry into the world of work 10 or even 5 years ago. Furthermore, many emerging occupations in agile, Fourth Industrial Revolution companies cannot even be classified as 'occupations' because they are too loosely structured and too impermanent to fit into any occupational classification system.

BOX 8.1: Redundant and new job roles identified by the WEF.

Redundant job roles	New job roles
Accountants and auditors	AI and machine learning specialists
Accounting, bookkeeping and payroll clerks	Big Data specialists
Assembly and factory workers	Digital transformation specialists
	E-commerce and social media specialists
Bank tellers and related clerks	Information security analysts
Car, van and motorcycle drivers	Information technology services
Cashiers and ticket clerks	Innovation professionals
Data entry clerks	New technology specialists
Financial analysts	Organisational development specialists
Lawyers	Process automation specialists
Mechanics and machinery repairers	Software and applications developers and analysts
Postal service clerks	
Statistical, finance and insurance clerks	User experience and human-machine interaction designers
Telemarketers	

Source: Centre for the New Economy and Society (2018:9).
WEF, World Economic Forum.

This will also require rethinking the relevance of fixed job descriptions with clearly described tasks, job outputs and skills requirements. A new system may be needed for Fourth Industrial Revolution work contexts in which the core functions of jobs are more loosely described, leaving it to the employees to work out the detail as they are required to continuously adapt to new technologies, innovative work processes and the changing work context. It will be essential to prepare the workforce for shifting, constantly changing and less prescriptive job descriptions; or to work without the clear job descriptions that are currently used in more traditional organisations. The same will apply to occupations that may need to be described more loosely, without clear task descriptions and stable sets of skills requirements.

The above-mentioned trends in redundant and new job roles, the fluidity within occupations and more flexible career paths pose significant challenges to the occupation-based skills development system under the Quality Council for Trades and Occupations. This will be discussed later in the chapter together with the above-mentioned Organising Framework for Occupations.

■ New skills required by the workforce

The WEF report on the 10 skills needed to thrive in the Fourth Industrial Revolution predicts that by 2021 about a quarter of the skills that are considered important in the workforce will have changed as some jobs grow and new ones become commonplace. 'What is certain is that the future workforce will need to align its skillset to keep pace' with these changes (Gray 2016).

The WEF's future of jobs report warns that new tasks in the new types of jobs will be driving the demand for new skills (Ratcheva & Leopold 2018):

> By 2022 the skills required to perform most jobs will have shifted significantly. Global average 'skills stability' – the proportion of core skills required to perform a job that will remain the same – is expected to be about 58%. That means workers will see an average shift of 42% in required workplace skills in the period leading up to 2022. (n.p.)

In a 2017 Deloitte study, Engelbert and Hagel (2017) also confirm that the reconfiguration of jobs, occupations and careers requires rethinking the skills that are needed in the rapidly changing work environment. As a large part of the workforce is already moving into jobs of shorter duration, this will require workers who are more flexible and continuously learning new skills. Those who find work will need a basket of essential skills that can be applied in diverse projects and adapted to different work contexts.

Studies by the WEF mentioned in this chapter and other reports (Davies et al. 2011; Deloitte 2018; Lee et al. 2018; NEDLAC 2019; Ratcheva & Leopold 2018) identify the skills that will be essential in

the new world of work, in addition to proficiency in new technologies. The list of skills includes uniquely human ones such as complex problem-solving, creativity, critical thinking, flexibility, initiative, interpretation, sense-making, social intelligence, novel and adaptive thinking and virtual collaboration. The list also includes other skills that are not yet clearly understood: computational thinking, trans-disciplinarity and cognitive load management. The skills required for the Fourth Industrial Revolution are described in more detail in Elana Swanepoel's chapter in this volume, 'Shifting Economies and the Need for New Skills'.

These skills raise important questions for the current PSET system. How does one 'teach' skills such as computational thinking, trans-disciplinarity and many of the others listed above? How should these skills be incorporated into the current qualification models – if indeed desirable? How will the current system of assessment and moderation need to be adapted in order to measure whether students have developed skills such as adaptive thinking and virtual collaboration? Will it even be possible to quantify these skills in the current system of awarding credits for learning achievements in the NQF? These are some of the issues that will need urgent consideration in rethinking higher education and the other sub-systems in the PSET system.

■ Challenges to key features of occupation-directed education and training

In a 2015 article entitled 'Survival of the adapted', Clem Sunter (2015), the scenario planner and futurologist, warns that the changing world of work has resulted in large-scale unemployment in many countries:

> [B]ecause schools and universities are still preparing their students for the market that prevailed fifty years ago. They have not woken up to the changing reality of business and the fact that technology has

> disrupted all of their cherished academic assumptions about what you should be taught to be a success in life. (n.p.)

Even before the COVID-19 lockdown started to damage much of the economy, there were indications of the mismatch in the PSET system between the supply (graduates) and industry demand (employment). The large number of unemployed graduates could be an indication that the system is not producing graduates with the skills that are needed in the economy. The analysis of trends in the post-school system by the National Planning Commission in its draft report acknowledges that the 'system lost some of its ability to be flexible and responsive' (National Planning Commission 2020:21).

Two sources of graduate unemployment statistics confirm this problem. According to Statistics South Africa (2019), the unemployment rate among graduates up to the age of 24 was 31% in the first quarter of 2019, which was an increase of 11.4 percentage points from 19.5% in the fourth quarter of 2018. The database of the South African Council for Graduates Cooperative includes 30 000 unemployed graduates of which 20 008 are from the TVET colleges. Substantial public funding is channelled for occupation-directed training to the TVET colleges (Bangani 2019). This is a further indication of the need to rethink the PSET system to add to the imperatives described above relating to the new world of work.

■ Occupation-focused system

The Sector Education and Training Authorities (SETAs) collect information on the skills needs in the various economic sectors through workplace skills plans that employers submit annually to their respective SETAs. This information is collected in terms of occupations that are registered on the Organising Framework for Occupations. The 2019 updated organising framework listed 1500 occupations that include commonly used titles, such as finance manager and chief information officer, as well as others with specialised titles, such as solar photovoltaic service technician.

The information in the workplace skills plans – supplemented by SETA research – is used to compile lists of 'priority occupations identified from hard-to-fill vacancies by employers and occupations that are required to advance South Africa's developmental needs' (National Skills Development Plan) (National Planning Commission 2019:23). These lists inform the sector skills plans compiled by each SETA and are also used to determine funding priorities and incentives for employers to support specific types of training.

This system could be relevant in a workplace context in which occupations are stable and job titles largely match the industry occupations on the Organising Framework for Occupations. However, it is necessary to rethink the relevance of using these occupations for skills planning in the changing Fourth Industrial Revolution work context– even if the Organising Framework for Occupations is regularly updated. The emerging jobs in the Fourth Industrial Revolution workplace, especially those in non-traditional, ground-breaking companies, often have ambiguous job titles that only vaguely relate to job tasks, and the job titles generally do not correspond to occupations on the Organising Framework for Occupations. The work done in SMMEs, and others in the informal and 'gig' economy, is rarely related to occupations on the Organising Framework for Occupations as workers perform tasks that cut across occupational boundaries. In the Fourth Industrial Revolution world of work, new 'occupations' will be emerging, mutating and/or disappearing before they can be recorded on the organising framework. The Organising Framework for Occupations is not designed to accommodate the fluid, less structured and continuously evolving 'occupations' of the Fourth Industrial Revolution. As it is not mandatory for employers to submit workplace skills plans to the SETAs – and many smaller organisations do not see benefits in doing so – SETAs fail to take note of the skills of the emerging Fourth Industrial Revolution companies that are likely to be the driving forces behind innovation in South Africa's competitive economy, such as Uber, Airbnb and Tesla.

The Organising Framework for Occupations is also used to develop qualifications and part-qualifications for specific occupations. This has resulted in a proliferation of occupation-specific qualifications, for example, four separate qualifications have been registered on the NQF for bus, taxi, train and truck drivers – despite the obvious similarities in the knowledge and practical skills of these drivers – and five qualifications have been registered for different footwear machinery operators whose jobs will probably be replaced by robots. The concern is that qualifications registered against specific occupations on the organising framework will not be relevant to the needs of the future workforce whose job tasks will no longer fall into clear occupational categories. If we do not rethink this system, we may be preparing students to 'find themselves equipped to live in a world that no longer exists' (Hoffer 1973:32).

◼ Registered qualifications and credit-bearing programmes

Public funding for occupation-directed training is almost exclusively allocated to programmes leading to registered qualifications and – to a minor extent – shorter accredited skills programmes. The NQF, supported by various quality assurance systems on institutional, sector and national levels, promotes education and training that enables students to gain credits for learning achievements that are nationally and internationally recognised. The logic and value of this system is not disputed; however, it gives rise to a perception that it is only learning activities that result in credits that have any value. Furthermore, the layers of quality assurance result in periods of five or more years from the design of the qualification to the completion of the programme before the students enter the world of work. The concern is that much of the knowledge and skills that the students will have acquired during the years of study will be irrelevant by the time they graduate and are confronted with technologies that were not even conceptualised when the

qualifications were designed. This problem relates to views on the diminishing relevance of knowledge and skills (Hart 2020):

> According to some the half-life of skills is also diminishing fast, with some skills having only an 18-month window. Knowledge and skills now have such a short shelf-life that it is frequently said that a college degree will be out of date before the loan is paid off. (n.p.)

The challenge for education and training is that the skills needs in the Fourth Industrial Revolution world of work will be unpredictable and continuously changing as new technologies disrupt work processes and entire industries. This will require demand-driven learning that happens in real time through just-in-time, short, rapid-fire interventions that are designed on-the-run to enable workers to solve problems for which no theory or model exists. Lee et al. (2018:9) warn that education systems 'need to react quickly on developments in the knowledge space, they need to be redesigned to allow for lifelong learning'.

The current system should be redesigned to be more responsive to the skills needs of the changing world of work. Alternative credentialing systems should be considered to formally recognise skills that are developed outside formal accredited programmes, for example, through digital credentialing or badges as described by Barbara Dale-Jones and James Keevy in the chapter in this volume entitled 'Digital credentials: discussions on fluency, data privacy and the recognition of learning in higher education beyond COVID-19'. Such systems are being explored internationally, for example, Herman De Leeuw (2018) who reflects on the 'UNESCO Report on Digital Credentialing', he cites Chakroun & Keevy as follows:

> [*T*]he opportunities that advances in digital technology will create for transforming education and training systems to build new credentialing methods and systems for capturing, recognising and validating learning outcomes in the era of lifelong learning. (n.p.)

According to Chakroun and Keevy (2018:5), '[d]igital learning records and open data sources are complementing traditional

qualifications repositories, while challenging the conventional models of credential evaluation'.

The fifth point in the WEF's future of jobs survey on things to know about the future of jobs (Ratcheva & Leopold 2018) is that retraining and upskilling of the current workforce is essential as everyone will have to become a lifelong learner. However, the concept 'lifelong learning' should not be interpreted to only mean formal education and training to gain credits on the NQF. In this regard, professional bodies should also recognise Fourth Industrial Revolution skills that are acquired through work and informal learning for continuing professional development alongside formal training or structured events that are credit-bearing. The WEF predicts that by 2022 approximately 54% of all employees will require significant re- and upskilling. The WEF emphasises the need for businesses to take an active role in supporting the skilling of their current workforces and governments 'to create an enabling environment, rapidly and creatively, to assist in these efforts' (Centre for the New Economy and Society 2018:v). These efforts should include the recognition for learning that falls outside the formal accreditation system.

■ Work experience as a pre-requisite in occupation-directed programmes

A large percentage of the occupation-directed programmes offered by universities of technology, universities, skills development providers and other institutions in the PSET sector require a period of placement in a workplace as an integral part of the qualification. This enables students to acquire competencies in applying their learning in an actual work context. The model benefits the students, especially by improving their chances of finding employment, as well as the workplace, which gets the opportunity to gain from the newly acquired knowledge and skills of the students.

Unfortunately, a substantial percentage of students, specifically those in outlying, poor communities, do not find work placement to complete their qualifications because there are limited work opportunities in rural areas and small towns. The analysis of the PSET sector by the National Planning Commission (2020:42) confirms that there is a 'fundamental challenge (in) gaining access to workplace learning as part of meeting qualification requirements for National Diplomas and occupational qualifications'. This situation is likely to get progressively worse as a result of the economic damage caused by the lockdown. As businesses reduce staff, streamline processes and focus expenditure on survival strategies – or close down – there will be even less work placement opportunities for students to complete their studies. It is unrealistic to expect employers to take in and support students after having reduced the number of employees to essential staff to cope with the crippling impact of the lockdown. Furthermore, most small and medium businesses, which constitute the majority of businesses in South Africa, do not have the staff capacity or know-how to assist students to meet the requirements of the work-experience component of qualifications.

The integration of learning and work will become even more important in the Fourth Industrial Revolution world of work. However, the feasibility of work experience as a compulsory component of qualifications should be reviewed in the context of the Fourth Industrial Revolution, COVID-19 and the unique South African business context. South Africa should avoid adopting models that work well in developed countries. One of the models that should be explored – and has been adopted by most South African professional bodies – requires a period of relevant work experience 'after' an individual has completed the necessary work towards the degree. Once this work experience has been completed, the individual will receive a nationally and internationally recognised professional designation confirming occupational competence. In a revised system, financial incentives such as discretionary grants and tax incentives, could be structured to encourage employers to provide opportunities for graduates to

gain relevant work experience 'after' obtaining their qualifications. This will address one of the current challenges. Students are not sufficiently knowledgeable and skilled when they enter workplaces, thus requiring extensive supervision and guidance (or being used for menial tasks that are not related to their qualifications).

◼ Focus on the skills needs in the formal economy

As indicated earlier in this chapter, most of the current occupation-directed programmes are designed for employment in the formal economy, but the PSET system should recognise the role of small businesses in the economy and rethink the current processes and requirements to address the skills needs in these entities. The 2018 study by the Small Business Institute (Vuba 2019) finds that about 250 000 small, micro, medium enterprises constitute 98.5% of the number of formal firms in the economy and account for 28% of formal jobs in the economy. Kerrin Land, managing director of Old Mutual Wealth, believes that the 'real power of a successful economy does not lie in big corporates but in the thousands of small businesses led by entrepreneurs' (The Citizen 2018). Land estimates that small and medium enterprises make up 90% of formal businesses, contribute about 34% towards GDP and provide employment to about 60% of the labour force (The Citizen 2018).

This emphasises the importance of entrepreneurship that Deloitte lists together with workforce readiness, soft skills and technical skills as the four skills categories to prepare the youth for the future in which jobs will change and where 'agility and continuous learning provide a foundation for growth' (Deloitte 2018:16). In the new work context, entrepreneurial skills will assist the youth to not only establish their own businesses, but also to enable them to enter freelance, contract or 'gig' work. It will assist them to overcome the barriers to entry into traditional employment and improve their ability to navigate changes as they move between formal and informal

work (Deloitte 2018:17). However, Deloitte recognises that success could be limited by policies, regulations and access to finance and business support (Deloitte 2018:17). In an earlier Deloitte report, Hagel, Schwartz and Bersin (2017:43) stress the need for public institutions to take proactive steps to prepare for new educational challenges through rethinking and redesigning regulatory frameworks to ensure that they support the new types of work and workers that will be needed to build a more entrepreneurial economy.

In addition to the above recommendation by Deloitte, the PSET system should make the changes needed to address the skills needs of smaller businesses and emerging, agile and more loosely structured Fourth Industrial Revolution businesses. The immediate skills needs of these businesses are unlikely to be met by registered qualifications or credit-bearing programmes. In order for the PSET system to be responsive to the needs of the workplace of the Fourth Industrial Revolution and the needs of smaller businesses, the current incentives to employers to support credit-bearing programmes for their employees and unemployed youth should be expanded to cover non-accredited training. Furthermore, the current cumbersome document that employers have to complete to record their skills needs (i.e. the workplace skills plan) should be simplified to encourage smaller businesses to participate in the sectoral skills planning system. The workplace skills plan should be redesigned to focus only on the essential questions relating to the current and anticipated future skills needs, the types of formal and informal interventions required to develop those skills, how the SETAs can assist employers in their sectors to develop those skills and what funding incentives will help the businesses and the industry to be more competitive. The redesigned workplace skills plan should not require all employers to submit information in accordance with the occupations registered on the Organising Framework for Occupations, although it could be used where job titles are the same or similar to the occupations on the framework.

■ Imperatives for rethinking the PSET system

The realities of Fourth Industrial Revolution and the economic impact of COVID-19 constitute strong imperatives for rethinking and restructuring the PSET system. Although there have been some adjustments to the system since the introduction of the *Skills Development Act* in 1998, a fundamental rethink is now required to ensure that the system is responsive to the new work and economic context.

The WEF (Centre for the New Economy and Society, 2018:7) stresses the urgency of systems-wide change that requires leaders in business, education and labour to formulate comprehensive workforce strategies that respond proactively to the challenges of the new world of work. The key factors that need to be considered include (Centre for the New Economy and Society, 2018:7):

- mapping the scale of occupational change and documenting the jobs that will be emerging and declining
- tracking the evolution of job-relevant skills
- developing the business case for investment in retraining, upskilling and workforce transformation
- identifying opportunities to use new technologies to enhance the work done by humans.

The WEF urged policymakers, regulators and educators to (Centre for the New Economy and Society 2018):

> [/]nvest heavily in the development of new agile learners in future workforces by tackling improvements to education and training systems, as well as updating labour policy to match the realities of the Fourth Industrial Revolution. (p. ix)

This call is supported in the National Economic Development and Labour Council (NEDLAC) report on the South African situation: 'Education needs a total "face-lift"; the entire education environment, from pre-school to postgraduate education, needs to be reimagined and aligned with emerging skills requirements' (2019:108).

It is a concern that there is no reference to the Fourth Industrial Revolution in the April 2020 position paper on the analysis of trends in the PSET system by the National Planning Commission (2020). This position paper explores what needs to be done to ensure that the goals and targets in the National Development Plan 2030 are met, what courses of correction are needed, and the key conditions required to realise the recommendations in the report. These issues cannot be addressed if the significant impact of the Fourth Industrial Revolution on the work context is disregarded, especially since the main priority of the PSET system is to prepare the current and future workforce to 'contribute to building a developmental state with a vibrant democracy and a flourishing economy' (DHET 2013:xi).

■ Conclusion and recommendations

This chapter explores the impact of the Fourth Industrial Revolution and COVID-19 on the workplace, jobs, occupations and employment relationships, as well as the skills that will be required for the current and future workforce to participate productively in the Fourth Industrial Revolution world of work. Against the background of the changed and continuously evolving work environment, the chapter analyses key features of the PSET system and identifies areas in which it is not aligned with the new challenges. The chapter indicates specific areas in which changes are required to ensure a future-fit system and makes recommendations on specific changes.

The recommendations for rethinking and restructuring the PSET system include reconsidering the use of occupations on the organising framework for collecting information on skills needs and developing qualifications for specific occupations which may disappear or be significantly different in the future. It is also recommended that alternative models for occupation-directed qualifications should be investigated to address the challenges that students experience in obtaining work placement as a pre-

requisite for obtaining qualifications. The value of Fourth Industrial Revolution skills acquired through more unstructured learning should be formally recognised through an alternative form of credentialing.

In restructuring the PSET system, in particular areas related to occupation-directed education and training, policy makers in the DHET, the Quality Council for Trades and Occupations and SETAs should collaborate with industry, professional bodies, HEIs and other stakeholders to ensure a demand-driven system that addresses the changing needs of the broader business sector, public entities and the workforce. This will require rethinking the assumptions and ingrained beliefs underlying the current system, and exploring innovative ways to restructure the PSET system. This will be essential for ensuring that the system is designed for its strategic role in preparing South Africa's current and future workforce for the volatility, uncertainty, complexity and ambiguity they will be facing in the world of work in the Fourth Industrial Revolution economy.

Chapter 9

Digital credentials: Discussions on fluency, data privacy and the recognition of learning in higher education beyond COVID-19[9]

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■ Abstract

Credentials have historically been thought of as tangible documents such as a driver's licence, a passport or a birth certificate. In the educational sector, a credential can be something like a degree certificate or a school leaving certificate. It is customary in contemporary society that an individual proves his/her identity or achievements by sharing a credential in one way or another. The advent of COVID-19, and in fact even many new developments during the months preceding the pandemic, has starkly illustrated that digital credentials are not only useful but also necessary for global citizenship and mobility (Dale-Jones et al. 2020). Together with this accelerated trend towards digitalisation, there is an increased risk of the potential abuse of data and information under the guise of the pandemic and more broadly, for non-altruistic purposes (Motsepe et al. 2020). This chapter draws on research into these areas, completed in May 2020, as well as research that has been underway in South Africa since 2018 to develop a national digital ecosystem for the post-schooling sector (Rajab et al. 2020; Shiohira & Dale-Jones 2019) in order to build a case for the responsible use of digital credentials for the recognition of learning beyond the COVID-19 pandemic. The chapter specifically positions the concept of self-sovereign identity as a key consideration for the education sector in the new digital age.

■ Introduction

The chapter explores the benefits of replacing the current higher education credentialing system in which external entities issue credentials to individuals to confirm identity, status and

achievements through documents with digital credentials. In the educational setting, credentials are generally in the form of a degree certificate or a school leaving certificate. This chapter illustrates the benefits of the utilisation of self-sovereign identity in the recognition of learning in broader education and training contexts throughout the student life cycle, and specifically in higher education, for a seamless and frictionless user experience. Educational credentialing can change the nature of the relationship between individuals and their educational data. The decentralisation of educational data through digital identities will enable students and others to control their identity records and data related to their education, training, assessments and skills, and provide this data for verification and transactions without the need to rely on institutions or a central repository of data.

The advent of COVID-19 together with many other new developments during the months preceding the pandemic have starkly illustrated the fact that digital credentials are not only useful but also necessary for global citizenship and mobility (Dale-Jones et al. 2020). Concomitant with this accelerated trend towards digitalisation, there is an increased risk of the potential abuse of data and information under the guise of the pandemic and more broadly, for non-altruistic purposes (Motsepe et al. 2020).

This chapter draws on research into these areas, completed in May 2020, as well as research that has been underway in South Africa since 2018 to develop a national digital ecosystem for the post-schooling sector (Rajab et al. 2020; Shiohira & Dale-Jones 2019) in order to build a case for the responsible use of digital credentials for the recognition of learning beyond the COVID-19 pandemic. The chapter specifically positions the concept of self-sovereign identity as a key consideration for the higher education sector in the new digital age.

■ The emergence of digital credentials

The body of work on digital credentials has been expanding at a pace over the last few years (Commonwealth of Learning [COL]

2019; Keevy & Chakroun 2018; Oliver 2019). The landscape is very dynamic, even described as a 'wild west' (Jirgensons & Kapenieks 2018), as the lack of clarity over standards, governance and administration processes (COL 2019) has created a vacuum wherein outlier organisations such as Mozilla and others are playing an important role. There is also an increased trend in South Africa where both public and private education institutions are starting to explore this new modality. PrivySeal, a local technology company working with both the South African Qualifications Authority (SAQA) and the South African Council for Educators, is a good example. Although many of these institutions have been involved with the massive open online courses and the open learning movement over the last two or more decades, the emergence of more dynamic and agile digital credentialing schema is still foreign to most. Quality assurance bodies are also grappling with validating what seems to be a moving target.

The intrinsic digital nature of this new form of credentialing is both a strength and weakness and, like the COVID-19 pandemic, also presents both a threat and an opportunity to South Africa and the wider global community. The new digital credentials are designed to be associated with extensive sets of metadata, making it possible to utilise big data techniques in new and incredibly sophisticated ways (Gloss et al. 2014). This presents a chance to link work opportunities with appropriately-skilled individuals, and many such examples are already being piloted internationally (Rampelt, Orr & Knoth 2019). One would imagine that with increasing unemployment because of the debilitating impact of COVID-19, such a 'line of sight' from job vacancies to available skills would be in even higher demand than before. The commensurate threat of this new form of credentialing also lies in its digital nature. The ability to regulate, quality assure or even just map a wave of smaller just-in-time pockets of learning that lie outside the traditional structures is simply not possible with the current credentialing system and thus opens the door for the exploitation of the public and, as is often the case, the more vulnerable sectors of society. The inevitable limited impact of traditional quality

assurance regimes to new 'qualifications' with an inherent digital nature, can lead to inferior and low-quality courses being offered with very few key signals available to the unassuming learner. Certainly not the signals they are used to, such as government endorsement or quality assurer's registration number. More progressive authorities across the globe, such as in New Zealand, Malta and the United States, have started to deal systematically with these risks, but there is still much to do, with the majority of countries at an early stage of managing the process.

In order to make some sense of this new constellation of credentials and the opportunities and threats it introduces, as noted above, it is useful to turn to a few contemporary ways in which the broader credentialing ecosystem in training is in some way, trying to self-correct. This rebalancing of the fluency equation between vacant jobs and available skills is inevitable and can be done in an organised and governed manner or be left to simply happen in an organic way. Taking a leaf from the last few decades of development in digital platforms such as Pymetrics, Skills Lab (managed by the European Training Foundation), Credential Engine, Mozilla and many others, a more organic model, even machine learning-based, would be better suited to the digital context, while a more structured, non-digital approach may be preferred by the humans involved. In this increasingly complex and data rich ecosystem, it is inevitable that the former will outlast the latter. Two examples are provided further to illustrate this. The first is rooted in an emerging digital architecture, while the second is a more human response to try and develop common metrics for learning, in this case, on a global scale.

The first example is the notion of interoperability. Two main types of interoperability are found in the literature: (1) syntactic interoperability, which is 'the ability of multiple systems to communicate and exchange data, regardless of whether or not they have shared programming languages or use interfaces'; and (2) semantic interoperability, which is (Shiohira & Dale-Jones 2019):

> [*T*]he ability of discrete systems to understand and make meaningful use of shared resources by using common interpretations of data and services and common identifiers for individuals as well as for institutions. (p. 23)

In order to make sense of interoperability, a range of frameworks are being developed such as the data commons framework and the statistical information system collaboration community. Examples include the World Wide Web Consortium and the well-known International Organization for Standardization, as well as open standards, such as the Open Geospatial Consortium, Statistical Data and Metadata eXchange and .Stat. Shiohira and Dale-Jones (2019) provide a useful overview of these various elements of interoperability, including the potential benefits to the mobility and portability of student data. An important related concept is data ownership and the differences between centralised and decentralised ecosystems. This will be discussed later in the chapter.

The second example is an international response to try and evolve more traditional normative instruments, such as the various regional UNESCO conventions, into a global convention on the recognition of qualifications concerning higher education (UNESCO 2019). The new global convention finds its alliances in the development of national and regional qualifications frameworks, most recently the move towards an African Continental Qualifications Framework (African Union Commission 2019). This example represents the intent to establish more independent global metrics within which learning can be recognised and made more transparent and portable across countries, regions and even continents. Encouragingly, there are signs of a new fourth generation of qualifications frameworks emerging. The beta version of the American Credential Framework (Keevy et al. 2019) is a key example that warrants greater exposure and review.

So where is this leading us? On the one hand, the emergence of interoperable systems and platforms is evident and, on the other, there is new thinking related to global metrics to recognise learning.

Common to these juxtaposed examples lies the notion of the locus of control of data. New thinking, such as the emergence of interoperable systems and platforms, suggests that the individual is at the centre of data ownership; new forms of legislation and increased data privacy measures across the world bear testimony to this. Historically, data belong to the education and training provider, the quality assurance body or even the relevant government department. Traditional systems such as qualifications frameworks and even conventions are more akin to older forms of data control, while interoperable systems lean towards decentralised forms of control and individual data ownership, as mentioned earlier.

In this time of COVID-19, the acceleration of technological solutions (Foster et al. 2020) is evident. This chapter argues that digital credentials present a real opportunity to rethink the recognition of learning beyond the COVID-19 pandemic. While the new approaches exemplified in digital interoperable systems and the growing response represented in recast normative instruments are not mutually exclusive, neither engages sufficiently with the foundational principle of data privacy. The next section introduces the concept of self-sovereign identity as a key consideration for the education sector for the digital age that lies ahead.

■ Self-sovereign identity

Currently, it is generally the case that third-party records over which we have no control prove who we are and what we own. This is a centralised identity model where a single authority has control over our data and where credentials like ID numbers or an Instagram login are issued to users by a third party. The model can be infuriating for the user, who has to remember all the username and password details for a wide range of different credentials, and where password reuse is consequently widespread. A report by Amber Gott (2017) claims that, on average, business employees make use of 191 passwords. This also

undermines the security of credentials and makes them more vulnerable to phishing and other fraudulent activities. Similarly, as with third-party records, data tend not to be portable but rather part of a larger dataset which is centrally owned (and sometimes abused or breached) by large corporations, such as the notorious recent case of Facebook and Cambridge Analytica.

The principle of self-sovereign identity is that control over identity data shifts away from central authorities to the individual in a move to a peer-to-peer data exchange where no one party controls the relationship with the other (Preukschat & Reed 2019). Self-sovereign identity is, in other words, a form of decentralised identity management (Allen 2016):

> Self-sovereign identity is the next step beyond user-centric identity and that means it begins at the same place: the user must be central to the administration of identity. That requires not just the interoperability of a user's identity across multiple locations, with the user's consent, but also true user control of that digital identity, creating user autonomy. (n.p.)

The principles of self-sovereign identity are that users must be able to not only access their identity data but also have agency with respect to their identities, which must be interoperable, widely available and global. Users' rights must be protected, and users must permit the use of their identity data. Another important principle is that systems and algorithms that host these data must be transparent and allow an identity to persist over time, whatever happens to the entity that first issued it (Allen 2016).

The question of what kind of technology is used to store data has had a significant and far-reaching influence on the development of such a decentralised model of data ownership (Dale-Jones et al. 2020). New models of data storage have developed in recent years and continue to emerge, whereby data are stored in decentralised systems without a central point that can control access and use. The blockchain specifically provides the technology platform needed to allow for a new model that has no need for a central authority. Blockchain technology and

other decentralised network technologies provide a strong solution for exchanging public keys directly. These form secure, private connections between any two peers and also store public keys on public blockchains in order to verify the signatures on digital identity credentials (also known as verifiable credentials) that peers can exchange to provide proof of their real-world identity (Preukschat & Reed 2019).

Self-sovereign identity is therefore made possible by technologies like cryptography, distributed ledgers and the decentralised blockchain, and thus the principles and the technologies of self-sovereign identity are closely interlinked and mirror each other. The verification of data occurs cryptographically, typically through the use of distributed ledgers. Because of this and because credentials can be verified and accessed whether or not the issuing organisation is operating at the time that verification occurs, self-sovereign identity gives individuals access to their own data at any time and the capacity to control who can access their record(s) and when (US Chamber of Commerce Foundation & T3 Innovation Network 2020).

How does self-sovereign identity work? The chapter does not cover the technical details of how self-sovereign identity operates, but explores the philosophy, approach and benefits of self-sovereign identity. Credentials, like an individual's passport, bank cards or medical records, are typically paper or plastic documents that are issued by a central authority such as the Department of Home Affairs, a bank or a doctor's rooms respectively. While the veracity of these credentials depends on that authority's verification of those credentials, what self-sovereign identity offers is the opportunity for individuals to have digital equivalents of these credentials that are private, secure and verifiable and over which the individual has control and agency. Each digital credential has a data or digital watermark that enables the trust between the parties in the data exchange. The watermark is enabled by cryptography and allows for the successful issuing, holding and verifying of the credential in a way that is significantly

more secure than traditional physical credential issuing. The digital watermark confirms firstly, who issued that data, secondly, when the data were issued and thirdly, that the data have not been tampered with.

Self-sovereign identity will not replace the Department of Home Affairs, for example, nor will it even replace the passport itself. Instead, self-sovereign identity provides a digital version of a credential, similar to a passport, which improves the user experience, increases privacy and security and reduces the burden of administration as well as the risk of phishing or fraud. Self-sovereign identity is, in other words, an improved digital version of a physical credential. It proves who (or what) issued the credential; to whom (or what) it was issued; whether it has been altered since it was issued; and whether it has been revoked by the issuer. Self-sovereign identity also sees the locus of ownership and control shift away from the central authority (the Department of Home Affairs, for example) to the individual user. With self-sovereign identity, no one person or thing is able to withhold an individual's access to his or her own data and the individual is able to choose what he or she shares with others.

Self-sovereign identity may seem radical but given the value of data and the dangers of allowing centralised organisations and systems to control and monetise data, it may ultimately be desirable to allow citizens not only to have agency in respect of their own data but also to control every aspect of their data. The situation in the COVID-19 pandemic is instructive in this regard. Extensive contact tracing to establish where points of contact have occurred between people is now being carried out by governments. While this is evidently appropriate for the gathering of public health data during a pandemic, the real risk exists that this data will be misused. Allowing citizens to have full ownership of their personal data through distributed and decentralised networks offers a solution for the protection of individual privacy. Consequently, there are self-sovereign identity initiatives emerging which aim to gather data safely during the pandemic. An example of this is the COVID-19 credentials initiative, which at

the time of writing is a global community of over 300 individuals from more than 100 organisations. These individuals and organisations are undertaking verifiable credential projects to help contain the spread of COVID-19 (see Linux Foundation Public Health [LFPH] 2020). The projects aim to ensure that data privacy is ensured.

■ Recognising learning beyond COVID-19

There is a strong case to be made for the utilisation of self-sovereign identity in the recognition of learning in broader education and training contexts. At one level, institutions of learning and workplaces issue student identity cards, course results, transcripts and qualifications, to name a few. This can be an expensive and administratively burdensome exercise for institutions, more so when work-integrated learning merges with more formal training programmes and is offered in more agile and accessible packages. For students, gaining access to educational credentials can be time-consuming and expensive. The processes students need to follow are mostly highly administrative on a local level and increasingly obtuse when attempting to secure formal comparability across countries and regions. The work of the National Academic Recognition Information Centres[10] network has been helpful in opening some of these debates, as has the Groningen Declaration Network,[11] but there is still a long way to go, and technology is advancing at a pace that the system cannot manage. COVID-19 has shown us that this pace of development will most likely accelerate even more in the coming months and years.

This chapter argues that self-sovereign identity provides an alternative. It offers flexibility to education institutions by providing them with the ability to issue students with digital credentials that

10. See https://www.enic-naric.net.

11. See https://www.groningendeclaration.org/.

allow the end user, the student, to prove their educational achievements anywhere, to anyone, at any time. These credentials can help students to gain access to other institutions of learning, to demonstrate their qualifications and experience and, ultimately, to secure a job. Self-sovereign identity gives students direct access to and agency regarding the management of these credentials while ensuring that data are not only verifiable, but also private. Self-sovereign identity also allows students to prove who they are, to interact securely and to share their educational credentials with anyone or any institution at any time, thus enabling not only the mobility and portability of learning but also lifelong learning.

Self-sovereign identity represents a paradigm shift in how digital identity is handled and its benefits apply equally to individuals, HEIs, companies and communities, but its uptake and success will only be realised when key stakeholders like governments and businesses start to accept each other's credentials (Preukschat & Reed 2019). It is understandable that there will be opposition to self-sovereign identity. Shifting the power balance to the student will be a complex and multi-faceted process and, in all likelihood, will only really happen organically. The vested interests of the broader education architecture, including providers, national authorities and even international agencies, are considerable, and there is much to lose by surrendering the power of the control over vast data lakes. The authors argue that, once the power issue is at least taken account of, self-sovereign identity can be used to support and digitise the whole educational ecosystem, including the work of educational institutions in areas of registration and authentication, the issuing of results transcripts and qualifications and, critically, linking the student to the world of work. Some examples relating to both students and institutions are described further.

■ Linking students to the world of work

Self-sovereign identity is ideal for a frictionless post-qualification experience – allowing students to move seamlessly into the job

market with the necessary proof of their achievements. Significantly, self-sovereign identity also allows for better matching of labour demand with skills supply. As such, self-sovereign identity can facilitate reciprocal relationships between education and labour. This may enable the education system to provide training on appropriate workplace-relevant skills based on a clear and current understanding of labour market needs. Self-sovereign identity provides students with digitally-enabled credentials that can be utilised to apply for jobs and be sent to prospective employers. This enables students to take control over their transcripts (which would reduce the paperwork as well as the administration burden on institutions) and to have them as verifiable evidence of their achievements.

Self-sovereign identity can enable matching between two ecosystems, with education on the supply side and labour on the demand side. Labour can publicise its requirements for certain types of skills, and education can respond in an immediate way. This would ensure that the education system is preparing appropriate skills for the workplace and would also allow for a clear and current view of oversupply or a low demand. These benefits would enable educational institutions and systems to reduce costs while increasing efficiency and security. For students, greater privacy and security is a key benefit, along with a preferable user experience. However, this presupposes an educational ecosystem that is sufficiently agile and non-bureaucratic, so as to be responsive to changing and newly emerging skills needs.

■ Registration and authentication

■ Self-sovereign identity for student registration

The self-sovereign identity benefit in education spans the student life cycle, but one of the most compelling uses is when students are registered and authorised. Here, self-sovereign identity allows

for greater efficiency and reliability, and for the cost of identity verification in the process to be reduced for both the user and institution. Universities and other institutions of learning require students to prove who they are before they can enrol and register for an academic year. This requires students to have physical proof of their identities and either use a university system to register or physically go to the campus. This process costs money and time for both the student and the institution. Digital identities allow students to be verified and enrolled or registered from a distance, using the credentials of their personal digital identity document. It also allows them to seamlessly log into university systems and access other campus services in a safer and more secure manner. Importantly, this leaves an audit trail. Students know what information has been requested and why. The eradication of usernames and passwords will provide improvements across the student life cycle and make for a seamless and frictionless user experience.

■ Self-sovereign identity for issuing of results transcripts and qualifications

Self-sovereign identity allows for the storage of academic records and issuing of certificates. Through innovations in blockchain technology, many kinds of digital verification and credentialing can be streamlined, removing the need for complicated and expensive processes. There are also growing solutions available to those students without access to smart phones or devices. Self-sovereign identity allows educational institutions to secure, share and verify their learning achievements. The blockchain can provide a certification database which keeps a list of issuers and receivers of each certificate, accessible anywhere, on any computer. Importantly, the certificate cannot be forged.

Besides the problem of fraud, another problem HEIs and students/alumni face is that paper or physical credentials can get lost or damaged. Higher education institutions have to reprint degrees and diplomas every year, which is costly for students as

well as institutions. Issuing a digital version of a degree or diploma will empower students, providing them with control and autonomy over their own credentials. Furthermore, micro-credentials can be issued for access to extracurricular activities, the completion of assignments or to prove class attendance.

Academic credential fraud is currently a thriving business. As mentioned earlier, the use of self-sovereign identity and digital identities can drastically reduce fraud. This will help potential employers to be confident in their decision to appoint a new staff member. Students can instantly apply for jobs and save time and money, while employers can save costs and time with the recruitment and human resource processes. Companies will be able to request information from applicants, and applicants will be able to download the necessary data and determine with whom it is shared. In other words, through self-sovereign identity, students will be able access and share genuine qualifications and credentials.

■ The challenges of self-sovereign identity

There are inevitably not insignificant challenges to self-sovereign identity, such as the time and cost of the personal responsibility for data security, as well as the complexity of individuals deciding who and what should have access to their data. However, these issues can be minimised and addressed by identity solutions. In addition, uneven access to the internet and appropriate computer technology, especially in rural communities and HEIs outside the major cities, will be an obstacle to the widespread use of self-sovereign identity. However, as these obstacles are addressed and mitigated, all students and HEIs will gain the benefits from migrating from the current system to self-sovereign identity.

■ Conclusion and recommendations

The interest in and relevance of portable, verifiable and interoperable credentials has increased as a result of COVID-19.

Linked to this, the emergence of immunity credentials along with processes like contact tracing has meant that the issue of data rights and privacy is of increasing importance. If the issue of data privacy is not addressed urgently, the control over who owns and uses a person's data could be entirely eroded. The opportunity exists for educational credentialing to change the nature of the relationship between individuals and their educational data. If educational data are decentralised, individuals with digital identities will be able to control their identity records, including data related to their education, training, skills, projects, job history, assessments and more. They will also be able to provide this data for verification and transactions without the need to rely on institutions or a central repository of data. Individual citizens will be able to turn their skills, training and experience into genuine value in the labour market and access better career and development opportunities.

Self-sovereign identity allows students to prove who they are, to interact securely and to share their educational credentials with anyone or any institution at any time, thus enabling the mobility and portability of learning. For the first time, since the concept of lifelong learning was first mooted in a UNESCO report (Faure et al. 1972), the technology is now available to realise this vision of a seamless learning environment, wherein all learning matters, albeit formal, informal or non-formal.

The notion of self-sovereign identity and the shift in the locus of control to the individual is not a straightforward matter and will not be uncontested. For it to be successfully deployed in the education system, it requires HEIs, quality assurance bodies, governments and businesses alike to recognise and accept each other's credentials. Its success will also require political will. Many local and international researchers and policymakers are exploring issues covered in this chapter. COVID-19 has been a wakeup call in many ways to a global community that was starting to explore these new ideas, which for many were simply futuristic and unlikely to materialise. The landscape has shifted in a short space

of time and it is foreseen that digital credentials will become more mainstream in the coming months and years. With this shift, the responsible use of these new ways for the recognition of learning both in higher education and across the education landscape needs to be carefully considered. Credential fluency and data privacy are explicit components of this process. Self-sovereign identity is the implicit side of the same (bit)coin.

Rationale for the internationalisation of higher education

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■ Abstract

The chapter presents a dimensional and multivariate internationali sation conceptual framework for higher education. The framework offers various development discourse options to HEIs for pursuing local, international and global educational reputation and aspirations. The framework facilitates decision-making on a preferred internationalisation profile, given the contextual realities in which particular HEIs operate, their institutional missions and values, the local circumstances and their aspirations to be globally relevant. The chapter begins by contextualising the internationalisation of higher education from a process perspective. This is followed by a description of five dimensions that influence the internationalisation attempts of HEIs, namely institutionalisation, participation, quality, recognition and the core functions of HEIs. The last section discusses the multivariate nature of the internationalisation process, which consists of 11 constructs that act as mechanisms to individually or collectively strengthen or weaken the internationalisation dimensions of HEIs.

■ Introduction

Although HEIs are international in nature, the internationalisation of higher education has aroused widespread global research interest over the past 40 years (Bordean & Borza 2013; Kushnarenko & Cojocari 2012; Matei & Iwinska 2015; Wihlborg & Robson 2018). Despite this growing interest, the internationalisation of HEIs still lacks an integrated conceptual framework of the rationale that drives the internationalisation process and simultaneously provides an explanation of the level of progress made over time in the internationalisation process.

The purpose of this chapter is to present a dimensional and multivariate conceptual framework that describes the rationale driving the internationalisation of higher education. This framework finds practical application in the various development discourse options it presents to HEIs for pursuing a local, international and

global reputation and educational aspirations. It is not by any means the intention of the framework to guide institutions to pursue the highest level of maturity on all dimensions. Rather, it should be used to decide which profile would be most appropriate, given the realities in which particular HEIs operate, their institutional missions and values, the local circumstances and their aspirations to be globally relevant (Kehm & Teichler 2007; McBurnie 2000).

As such, the framework facilitates understanding of the complexity and interdisciplinarity of higher education internationalisation, its focus and possibility types and possible discourses in a specific context. It can be further used as a tool to guide internationalisation decision-making in higher education. This chapter is organised into three main sections to best explain the changing discourse of higher education internationalisation. The first section delineates and contextualises higher education internationalisation. The second section explains the dimensionality of higher education internationalisation, while the third section discussed the multivariate nature of higher education internationalisation.

■ Delineating and contextualising higher education internationalisation

Internationalisation as a constantly changing concept is influenced by social, economic, political and academic factors. An array of definitions has been presented to frame the evolution of the concept of internationalisation of higher education (Figure 10.1).

The Hungarian scholar Vilmos Vass (2018:1), among many others, emphasises that '[i]nternationalization and globalisation of higher education has been a driving force of redesigning universities in the 21st century'.In this chapter, the internationalisation of higher education is described as (1) the purposeful incorporation process of (2) global, international and intercultural dimensions and (3) weighted combinations of internationalisation activities (4) into the expected deliverables (5) provided by a higher education system of a country or territory.
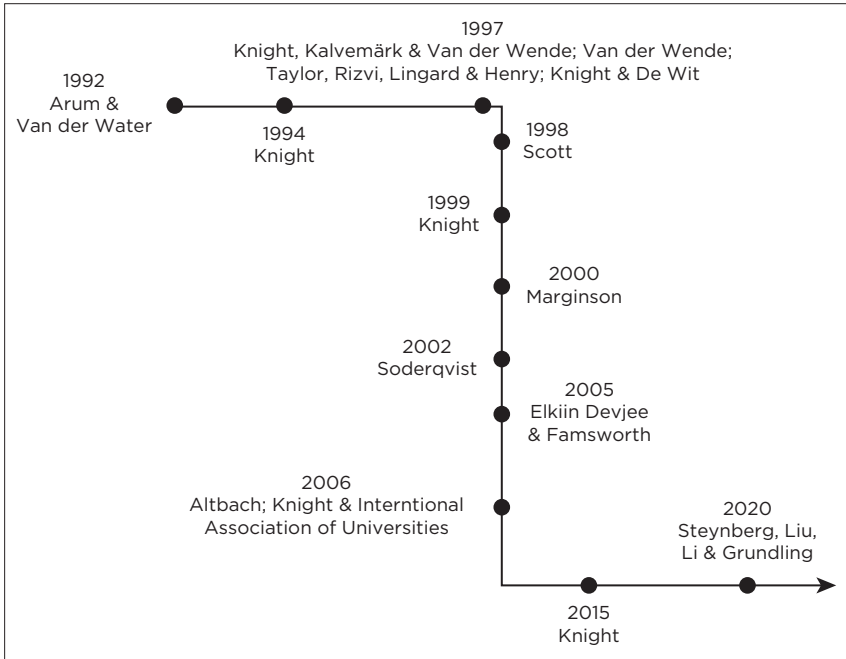
FIGURE 10.1: Evolution of internationalisation definition.

The internationalisation of higher education can be interpreted as a dynamic engagement with the development of policies, plans, programmes, strategies and approaches that embrace the entire functioning of higher education (Zhao 2003) and at different management levels in order to advance internationality for creating better value to constituencies of higher education in a particular country. The description is based on a synthesis of the definitions provided in Table 10.1.

It is important to depart from the preceding description of internationalisation of higher education because it is often mistakenly equated with concepts like *international education, international studies* or *transnational education* (Cummings & Bain 2009; De Wit 2002; Egron-Polak 2013; Friesen 2013; Maringe, 2010). Such a misconception ignores the dimensionality and

TABLE 10.1: Definitions of higher education internationalisation.

Author(s)	Year of publication: page number	Definition
Arum and Van der Water	1992 (as cited by Knight 2004:9)	'Internationalisation refers to the multiple activities, programmes and services that fall within international studies, international education exchange and technical cooperation.'
Knight	1994:7 2003:1 2008:21	'Internationalisation at the national, sector and institutional levels is defined as the process of integrating an international, intercultural or global dimension into the purpose, functions or delivery of post-secondary education.'
Kälvemark and Van der Wende	1997:19	'Internationalisation is any systematic, sustained effort aimed at making higher education (more) responsive to the requirements and challenges related to the globalisation of societies, economy and labour markets.'
Van der Wende	1997:19	'Internationalisation in higher education includes any systematic, sustained effort aimed at making higher education (more) responsive to the requirements and challenges related to the globalisation of societies, economy and labour markets.'
Taylor et al.	1997:57	'Internationalisation refers to the relationships and transactions between nations rather than those which transcend national boundaries.'
Knight and De Wit	1997:8	'Internationalisation of higher education is the process of integrating an international/intercultural dimension into the teaching, research and service functions of the institution.'
Scott	1998:126, 113	'Internationalisation reflected – and maybe still reflects – a world order dominated by nation states' (1998:126). 'Universities are nation institutions, created to fulfil national purposes' (1998:113).
Knight	1999:13	'An international dimension means a perspective, activity or service which introduces or integrates an international, intercultural or global outlook into the major functions of an institution of higher education.'
Marginson	2000:24	'The term "internationalisation" describes the growth of relations between nations and between cultures.'
Söderqvist	2002:29	'Internationalisation is a change process from a national higher education institution to an international higher education leading to the inclusion of an international dimension in all aspects of its holistic management in order to enhance the quality of teaching and learning and to achieve the desired competencies.'

Table 10.1 continues on the next page →

TABLE 10.1 (Continues...): Definitions of higher education internationalisation.

Author(s)	Year of publication: page number	Definition
Elkin, Devjee and Farnsworth	2005:39	'It should aim to create values, beliefs and intellectual insight in which both domestic and international students and staff participate and benefit equally. It should develop global perspectives, international and cultural and ethical sensitivity and useful knowledge, skills and attitudes for the globalised marketplace.'
Altbach	2006:123	'Internationalisation can be defined as the specific policies and programmes undertaken by governments, academic systems and institutions, and even individual departments, to deal with globalisation, and is thus a multilevel phenomenon.'
Knight and International Association of Universities	2006:2	'Internationalisation of higher education is the process of integrating an international/intercultural dimension into the teaching, research and service elements of an institution.'
Knight	2015:2	'Internationalisation involves the incorporation of global, international and intercultural dimensions into goals, objectives, content and delivery of higher education.'

multivariate nature of higher education internationalisation. It is apparent from its dimensionality and multivariate nature that wide-ranging regional higher education internationalisation contrasts will occur vis-à-vis historical, political, economic, cultural and other contextual features, methods and drives to internationalise higher education (De Wit 2002; Luijten-Lub, Van der Wende & Huisman 2005; Maringe 2010; Marmolejo 2010; Matei & Iwinska 2015). These contrasts can clearly be seen in aspects like expected benefits, engagement in internationalisation activities, geographic priorities and ideologies that exist in particular territories, resource capabilities and curriculum integration.

For example, Europe, Latin America and the Caribbean highly prioritise outward mobility, while international research cooperation is ranked higher in African, Asian and the Pacific and Middle Eastern HEIs. Recruitment of self-funding international undergraduates, globalisation of curriculum, regional research
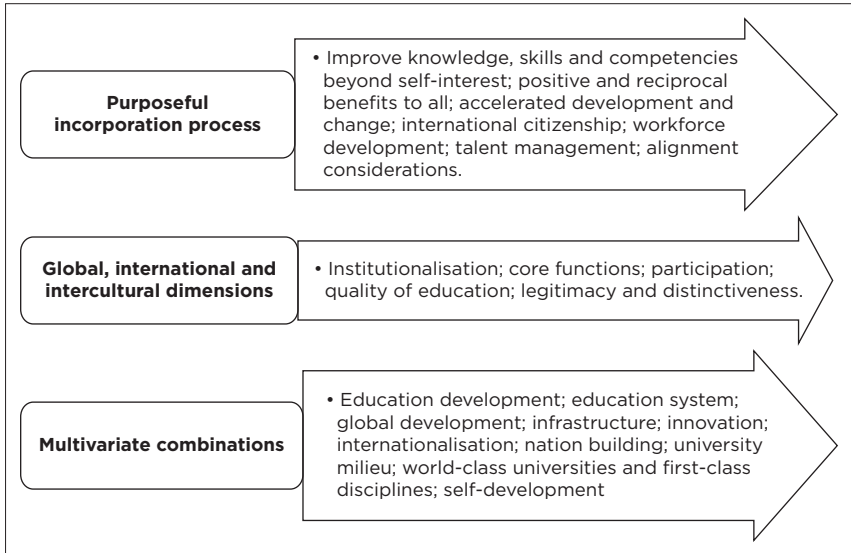
FIGURE 10.2: Critical elements in the higher education internationalisation process.

and foreign language training are priorities in North America (De Wit 2002; Egron-Polak & Hudson 2014).

In the following subsections, the three critical elements in the internationalisation process of higher education will be explained, as depicted in Figure 10.2.

■ Higher education internationalisation is a purposeful incorporation process

Education is centrally positioned in internationalisation. According to the International Standard Classification of Education (ISCED 2012), education's overall goal is to enhance knowledge, skills and competencies within any personal, community, social or employment-related context. In the context of higher education internationalisation, the achieved outcomes should be positive, of reciprocal benefit to all concerned and common values should be upheld (Helms et al. 2015; MacGregor 2014).

To achieve this in a global networked international competitive environment is not only challenging, but also requires strategic responses to initiate accelerated development and change in the higher education system and thereby realise national ambitions. According to scholars like Maringe, Foskett and Woodfield (2013), Tahira and Khan (2015) and Buckner (2019), this implies, amongst others, quality improvement of higher education, scholarship, knowledge development, talent recruitment, workforce development, international positioning and international citizenship, and providing greater value to the constituencies of HEIs as priorities in the internationalisation of higher education.

It can firstly be concluded that the internationalisation of higher education should never be regarded as a goal in itself, nor should it be used solely to pursue the self-interest of higher education (for ourselves) or what Brandenburg et al. (2019a) label an 'in-house' approach to internationalisation in higher education. It should be considered as an instrument that can be used to enhance the deliverables that higher education in a particular country or territory can offer to its various constituencies such as students, faculty, alumni, government, business leaders, industry and other societal stakeholders. In other words, through social engagement, higher education can provide deliverables to improve society as a whole. Secondly, the internationalisation dimension of higher education may result in some convergence in deliverable ambitions of higher education. However, the local dimension of higher education necessitates the planned transfer, modification and adoption of deliverables to the local circumstances of a particular country or territory to ensure the distinctiveness of territorial higher education. Finally, when the internationalisation of higher education is adopted, HEIs need to be willing to accept a responsibility in higher education that improves education within and beyond the individual HEIs and to societies at large.

Higher education internationalisation should be approached in a sequential, systematic, coherent and sustained manner

(Zhao 2003), which is structured in such a way that the local higher education system will achieve its ambitions while being partially compatible, harmonised and comparable and in line with educational systems and standards around the world (Helms et al. 2015). In this context, harmonisation implies a process whereby different institutions or national higher education systems agree to adjust their practices in all aspects of the higher education system to achieve mutual benefit (Helms et al. 2015).

More comprehensively, Knight (2004) describes it as a process of integrating the international, intercultural and global dimensions into the purpose, function or provision of post-secondary education. The process includes, amongst others (1) understanding the global higher education landscape, (2) translating the global dimensions of higher education to the local environment, (3) adjusting the global dimensions of higher education to the local environment by adapting, modifying and infusing the dimensions with various meanings and (4) articulating how internationalisation would be institutionalised to ensure that learning is realised across cultural and national boundaries (Buckner 2019; McDonald & Van der Horst 2007). Over time, the internationalisation process evolves towards a more mature level when a shift occurs from moving from knowledge mobility provided to a minority of participants towards providing global competence to all, including the immobile majority in a country (Helms et al. 2015).

■ Internationalisation dimensions

■ Internationalisation adds a global, international and intercultural dimension to higher education

The internationalisation of higher education adds an international component to complement local content and provides some form of recognition for participation in the process to improve the quality of education, scholarship and international citizenship

and to provide better life opportunities (Sehoole et al. 2019; Tahira & Khan 2015). In particular, the internationalisation of higher education confers both legitimacy and distinction on individuals and HEIs alike (Buckner 2019).

In this subsection, the dimensional aspects of the internationalisation of higher education are described. In general terms, a dimension refers to the existence of a magnitude in an observed phenomenon. For the purpose of this subsection, the dimensions institutionalisation, core functions, quality, recognition and participation will be discussed in the following paragraphs, with letter labels as depicted in Figure 10.3.
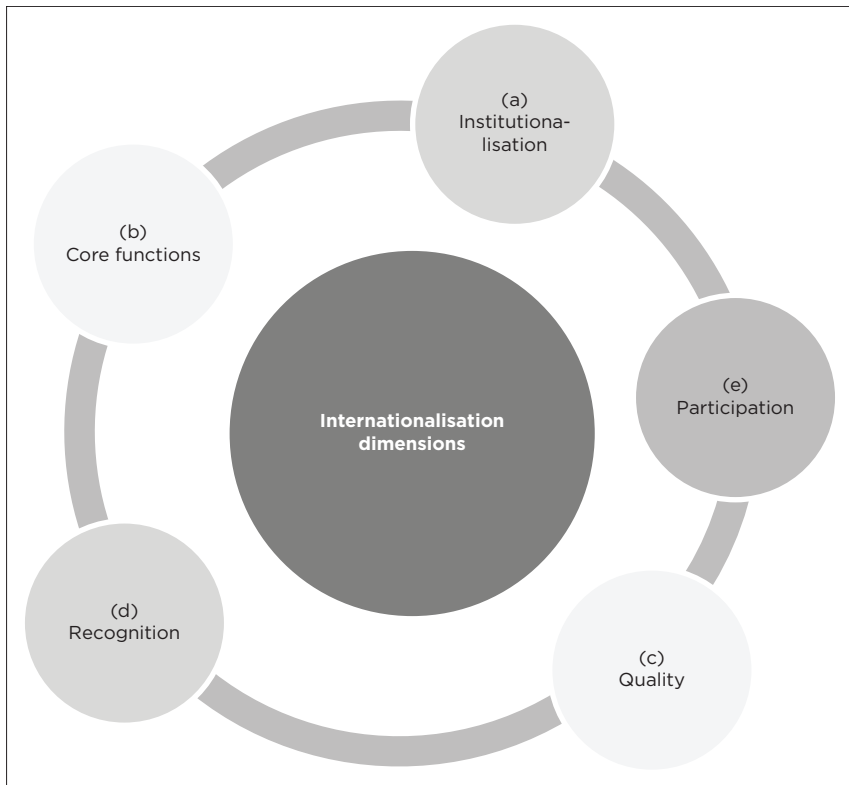

FIGURE 10.3: Internationalisation dimensions of higher education.

■ The five internationalisation dimensions

□ (a) The level to which global, international and intercultural societal aspects are institutionalised in higher education

Various approaches can be followed to institutionalise internationalisation into the core functions of higher education. In general, institutionalisation refers to the establishment of organisational and support features with some form of permanence into the core functions.

Youtie et al. (2017) distinguish, for example, three main architectural approaches. The first approach is based on a systems and life-cycle approach that can be negotiated, namely bilateral, networked, institutional building and functional expansion approaches. The second approach is based on a three-dimensional approach, namely (1) the extent to which nominal institutional characteristics are met, such as formal names and agreements, (2) the 'requirements of a fully institutionalised research venture based on characteristics such as formally designated directors and administrative support and (3) the role of supporting characteristics such as government funding or intellectual property arrangements' (Youtie et al. 2017:1693). The third approach is based on an architectural approach that reflects levels of government involvement resulting in the following classifications of institutionalisation: (1) government-directed, (2) government-facilitated, (3) non-government-collegial and (4) non-government-contingent institutionalisation. Within each type variations may exist, based on various factors like location, longevity, purpose, management and administrative support requirements, operations and available technology.

□ (b) The level of internationalisation in the functional dimensions of higher education, namely teaching, research and service to its constituencies

The functions to be performed represent the institutionalised, planned and intentional functions required by the national higher

education system of a particular country (ISCED 2012). Zolaghari, Sabran and Zolfaghari (2009) identify teaching, research and service to the constituencies of higher education as the functional dimension in the internationalisation of higher education. A key challenge of teaching internationalisation is to support both mobile and non-mobile students' international knowledge and competencies in an international classroom when preparing them to become part of a workforce that can function in the local market and also successfully link to the global environment. In addition, research in higher education demands more joint efforts and international cooperation as a result of increasing specialisation and investments in specific disciplinary fields (Veniger & Flander 2017). This clearly demands a shift from the traditional model of managing teaching, research and service delivery. Due to the availability of the Internet of Technology and future-facing technologies, it is now possible to construct and build educational spaces with mixed virtual-plus-reality environments that can enhance teaching, learning, research and service intelligently to constituencies of higher education (David 2018).

For example, in the teaching domain, the system can be grounded in hybrid teaching modes that combine traditional teaching methods with networked teaching, promote interactivity and convenience, continue improvement and monitoring of quality, provide more opportunities for practising, provide daily opportunities for assessment and grading and provide opportunities to assess the teaching effect (Yu 2019). The *rain classroom,* an intelligent teaching tool jointly developed by Xuetang Online and Tsinghua University Online Education Office in China (Hu et al. 2019), for example (Yu 2019):

> [*C*]overs every teaching session before class – in class – after class, providing complete three-dimensional data support for teachers and students, personalized reports, automatic task reminders, to make teaching and learning more clear. (p. 118)

David (2018) concludes that with the advanced technology available to higher education in the 21st century every stakeholder or constituency in the higher education sphere could benefit

from these advances while the barriers of language, geography and economic status are broken down. This could moreover be achieved at a lower cost and with greater collaboration possibilities across programmes, while individual researchers would still be identifiable for the unique contributions they make. Through the internationalisation of the core functions and by utilising the latest technology empowerment tools, higher education in certain countries will be able to become destinations for the most brilliant minds, and transform the basic fabric of teaching, research and service to constituencies (Meek & Suwanwela 2006).

However, the reason why the core functions of higher education should also contain an internationalisation dimension is not vested in technology only. The Netherlands Association of Universities of Applied Sciences and the Association of Universities in the Netherlands (2018), for example, relate the internationalisation of higher education with the three core accomplishments of education, namely socialisation, personality development and qualifications. The socialisation accomplishment serves the purpose of bringing participants into contact with other cultures, provides them with opportunities to reflect on their own cultures and traditions, to acquire intercultural competencies and to apply this knowledge in new contexts. The personality development accomplishment serves the purpose of developing participants into autonomous, self-reliant and independent individuals with a critical outlook based on insights gained from rich experiences and diverse viewpoints from other countries and cultures. The internationalisation accomplishment in qualifications serves to equip participants with both international insights and 21st century skills. These insights and skills prepare participants for work in a global and international context and to resolve local and global societal issues such as climate, health, safety and food, infrastructure and other big challenges. These challenges can only be overcome through international collaborations, open exchange of ideas, research data, research findings and researchers and through the development and application of new and complementary knowledge.

☐ (c) Quality

Another dimension to consider in the core functions of higher education internationalisation is the concept 'quality'. Today, the focus of higher education has shifted from being a numbers game and offering quantitative results on teaching, research and service, towards greater care provided to individuals, the prioritisation of human values and taking care of society. This requires a response based on five dimensions (Brandenburg et al. 2019b; Stallivieri 2019):

- Reciprocity and cooperation balancing as it relates to geographical location, valuing different languages, partnerships, knowledge production and extension and accreditation of qualifications.
- Accountability refers to transparency and visibility of how the benefits of international engagements benefit the constituencies of higher education at large, including the sponsors of projects. It is of particular importance to build internationalised ecosystems derived from international experiences by means of knowledge sharing and human capital development initiatives.
- Sustainability can be enhanced by sharing results to build a favourable climate for requesting more funding and investments for initiatives and to obtain institutional and government support.
- Inclusion implies that higher education should be assessed in terms of how it intentionally and purposefully provides benefit to the wider communities at home and abroad through the use of international resources. In other words, how it brings local benefits to the global community and how global benefits are transferred to the local community in any activity in which higher education participates. 'Internationalisation for all' should be the starting point for all higher education institutional strategies and it should be based on equality for all in terms of opportunities.
- Compliance with high-quality internationalisation should be the ambition of higher education, and monitoring mechanisms to assess quality need to be developed in the process of co-working, co-learning and co-production.

☐ (d) Recognition

With the adoption of the Global Convention on the Recognition of Higher Education Qualifications by the UNESCO General Conference, students studying abroad will be granted the right to receive fair, transparent and non-discriminatory evaluations of their qualifications (Almazova, Andreeva & Khalyapina 2018). In the new dispensation, the burden of proof shifts from the applicant to the recognition authority in a particular country that needs to comply with shared principles, recommendations, practices and legal provisions (Morland & Skjerven 2019).

☐ (e) The level to which higher education participates in global, international and intercultural societal aspects

Internationalisation of higher education goes hand-in-hand with cross-border partnerships and alliances that involve an array of stakeholders that collaborate in different spheres of higher education like teaching, research and community service. The purpose of forging partnerships is, amongst others, to bridge the gap between theory and practice, and to build local and global capacities and educational hubs (Fielden 2013; Helms & Rumbley 2016).

Sustainable relationships depend firstly on the recognition of and respect for differences in contexts, needs, goals, partner interests, market forces, competition and prevailing economic and cultural conditions (De Wit 2011; De Wit & Hunter 2015; Mihut, Altbach & De Wit 2017). Secondly, to serve the common purpose of partnerships, the constituencies involved need to accept the rules that will guide the relationships between constituencies and the interdependencies in the relations that can often be relatively complex (Jooste & Heleta 2015). Thirdly, partnerships require a great deal of time and resource investment as well as persistence to build international relationships (Zhang, Kinser & Shi 2014).

It is often found that one partner's influence on the relationship can be seen as stronger or weightier than the

other because of factors such as a more substantial financial contribution to the partnership. These complexities call for the introduction of equality checks and balances in any international partnership to guide decision-making, prevent domination of one partner over the other and ensure the sustainability of the partnership. In this regard, the Nelson Mandela Bay Declaration on the future of internationalisation states that the future agenda for internationalisation should concentrate on 'gaining commitment on a global basis to equal and ethical higher education partnerships' (Hagenmeier 2015:9).

Partnerships and global networks are currently sectors to engage new partners and leverage not built only along institutional lines, but also along cross-partnership assets to achieve greater benefits for all higher education constituencies, including businesses and citizens (Jooste, De Wit & Heleta 2015). Middlehurst (2015) illustrates this tendency by means of 'Triple helix' innovation systems where product development is done by industry and policy-making is done by government, while academia is responsible for knowledge creation and development. The Triple Helix approach was first introduced by Etzkowitz and Leydesdorff (1997, 1998, 2000), where university–industry–government play a significant role in supporting the development of an advanced economic environment. Thus the Triple Helix specifically recognises the importance of higher education for innovation. However, it can be considered that the Triple Helix focuses on the development of knowledge and innovation so that it is consistent with the knowledge economy.

■ The multivariate nature of international higher education

In an empirical study, Steynberg et al. (2020) identified 11 constructs that interact and influence the international standing potential of a higher education institution. As illustrated in Figure 10.4, the constructs are:
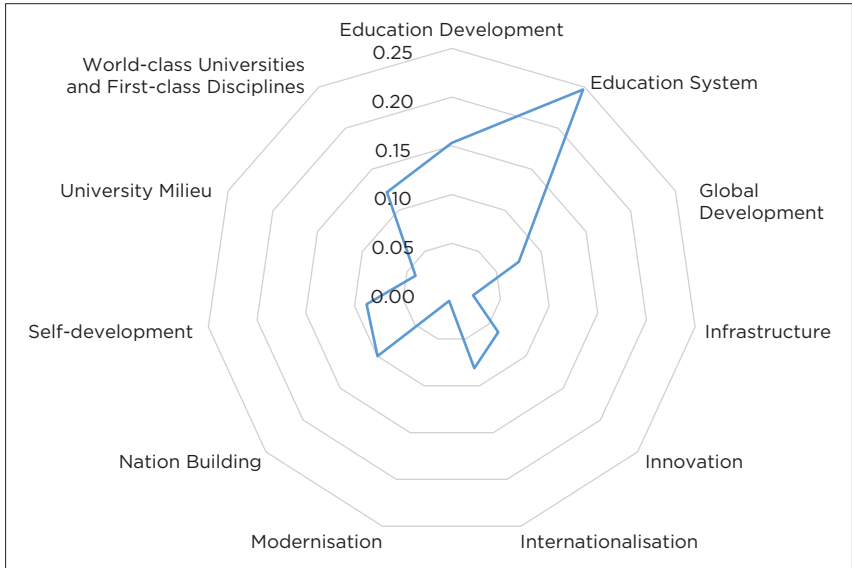
FIGURE 10.4: Illustrative example of the variables influencing higher education internationalisation.

- **Education development:** For instance, the Global Sustainable Development Report 2019 launched in September 2019 stressed the urgency of approaching each sustainable development goal as a system within a system, as well as the role of science in tackling the grand challenges.
- **Education system:** It is vital for educational systems to be designed and strategies developed on how local and global systems of higher education interact to improve service delivery to constituents of universities and to eliminate inequalities locally and globally (Naidoo 2018). Higher education systems should never be developed simply to serve an economic purpose. Rather, the system should be designed in such a way that each of the global sustainable objectives can be realised.
- **Global development:** This variant is often associated with the greater emphasis placed in the world on competition, market processes and commercialisation and the effects they

have on cross-border education development, in particular as it relates to the flow of ideas, resources, people, economy, value, culture, knowledge, goods, services and technology (De Wit 2011; Knight 2017). In the higher education environment, globalisation is regarded as an external process and a catalyst for the transformation of higher education systems and institutions that has profoundly impacted the process of internationalisation. In this respect, it can be asked how HEIs could ethically engage the 'global development arena' while they are operating from uneven positions of power and influence within the modern/colonial global imaginary (Stein, Andreotti & Suša 2016:20).

- **Infrastructure:** Internationalisation activities can be regarded as more complex than engaging with local or national higher education activities. It is inconceivable for higher education to be engaged in internationalisation activities without providing extension services like language classes, internationalised curricula, quality teaching, accommodation for foreign scholars and students, information and administrative support, counselling, health services and laboratories. In the same vein, facilities and programmes should be provided which act as a means to ensure cross-fertilisation between foreign and local scholars and students (Teichler 1999).

- **Innovation:** Within the higher education system and by placing emphasis on knowledge transfer, the systematic coordination between higher education, the business sector, public authorities and civil society (known as the Quadruple Helix) is essential to stimulate innovations and knowledge-based growth in a country. The Triple Helix was expanded to the Quadruple Helix by the inclusion of the 'media-based and culture-based' public and 'civil society' helix that was co-developed by Elias Carayannis and David Campbell in 2009 (Carayannis & Campbell 2018). The Quadruple Helix integrates 'media-based democracy' to the public, stressing that when the government implements innovation policy in order to improve the economy, it must effectively communicate its

innovation policy through the media to the public and civil society in order to gain public support for new strategies or policies (Carayannis & Campbell 2009). Furthermore, the interrelatedness between education, research and innovation should be acknowledged. The amount of emphasis placed on the coordination between actors and the interrelationships between education, research and innovation will largely determine what type of innovation orientation will evolve and therefore it is vital that the optimal balance be found (Unger & Polt 2017). Unger and Polt (2017) distinguish four types of innovation orientations, namely:

- ○ **Inno-preneurial –** This orientation emphasises innovation and entrepreneurialism
- ○ **Commerce-preneurial –** This orientation focuses on the commercialisation of innovation and marketable products in specific high-technology sectors
- ○ **Education innovation –** In this orientation, students are invited to participate in projects that have real public or private clients and apply their professional skills
- ○ **Research innovation –** In this orientation, the focus falls on problem-solving using inspired research that makes a real impact on people's lives.
- • **Internationalisation:** While higher education always has a place-based locality and purpose, it is also embedded in a global, universal knowledge network that originates from various countries in the world. The nature of this network is and will remain international. Internationalisation is primarily built on the three pillars of student mobility, international research collaboration and transnational education that needs to operate in synergy and provide benefits to all constituencies involved. Empirical research clearly indicates that a trend exists all over the world for HEIs to collaborate and interact internationally (Marginson 2011). In addition, those countries that have supportive internationalisation policies tend to produce high-impact research in terms of field-weighted citation impact above the global average, and

with international cooperation in research, higher significant research outputs are produced (Ilieva, Tsiligiris & Killingley 2019).

- **Modernisation:** This concept is concerned with finding new ways to support development locally and globally, and to establish well-to-do societies through the relationship that exists between education and the overall development of human beings.

- **Nation-building:** The purpose that higher education should commit to includes working to change, improve and revitalise the surrounding social, economic and political environments. In this role, HEIs act as sites for technological and scientific innovation and research, promote the enlightenment of scholars and free social thinking, and act as training sites for the future workforce. The recasting of HEIs to serve and develop the nation requires information from their various constituencies, including the state, labour market, civil society, professional practitioners, alumni and students. Without these actors, HEIs will not be able to act as catalysts for nation-building (Hornsby & Osman 2019).

- **Self-development:** Higher education is first and foremost about self-formation. During this time, scholars and students engage in teaching, learning and research to develop a unique identity, gain knowledge and skills and learn to take care of themselves. Therefore, its core is the self-development of the present and projected future (Mihut et al. 2017). For this reason, a university needs to take care of both the academic and personal needs of its constituencies (Klemencic 2016).

- **University milieu:** The milieu of a university represents how a university should continue to evolve in a modernising world, rather than focusing on what it is. As such, universities should continuously reflect on how relationships should be forged between HEIs, humanity and the world. Amongst others, they should consider their stance to promote performativity and reconnect with reason, the nation-state and culture, while at the same time remaining relevant in the global context.

Barnett (2018), for example, is of the opinion that the relevant universities in the new millennium will be those that are known as 'ecological universities' that take care of knowledge, social institutions, persons, the economy, learning and the natural environment.

- **World-class universities and first-class disciplines:** This construct represents a prestige and academic merit construct. Becoming a world-class university offering first-class disciplines has become an aspiration for HEIs around the globe. This is even true for those universities in the world which are unlikely to achieve a significant standing in world rankings. Under normal circumstances, world-class universities are in a better position to attract more resources, conduct better research and attract more reputable scholars and students. Universities with a low prestige and merit record are normally only able to attract the most disadvantaged individuals from the local and global environment (Naidoo 2018).

■ Conclusion and recommendations

For a considerable time, the internationalisation of higher education occurred in the absence of a conceptual framework that could assist institutions in decision-making by taking into account the rationales that drive the process. The rationales were expressed according to the multidimensional and multivariate nature of higher education internationalisation.

The proposed process-driven internationalisation conceptual framework enables decision makers to adopt an integrated approach to the internationalisation process by considering 11 constructs that may individually or collectively cause the strengthening or weakening of higher education internationalisation in a particular educational context. By considering local and global circumstances as well as the ambitions of specific HEIs, a desired internationalisation approach can be constructed according to a fit-for-purpose principle. Further, the proposed framework

is useful irrespective of differences in the education systems of countries. Hence, the framework can also be applied to assess the compatibility and comparability of HEIs' internationalisation profiles and approaches.

Promoting age-friendly universities that engage new groups of older adults

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12. The author has worked on the development of an age friendly university initiative while working at two universities – one in the UK and one in Ireland. As Head of the Centre for Lifelong Learning at the University of Strathclyde, Scotland in the UK, he contributed to setting up the AFU project which also involved Dublin City University, Ireland and Arizona State University, USA. He continues to be involved with the project through his ongoing research as Honorary Researcher at Dublin City University.

■ Abstract[13]

Universities have the potential to bridge disciplinary and geographic barriers to overcome the intellectual compartmentalisation that has often impeded later-life learning, research and practice. In this chapter, a vision is outlined for later-life learning within the university, using the concept and strategic focus of the age-friendly university (AFU). The chapter explores how two universities worked together to develop shared ideas and principles about AFUs. The chapter lists the foundational elements of 10 AFU design principles, illustrating how implementation of these design principles has transformed the universities to become lifelong learning universities for students of all ages. The transformation was brought about through new forms of intergenerational teaching and the development of new strategies for university–community partnerships. These new synergies advanced the mission of higher education for all ages. The chapter demonstrates how the two universities have sought to bring about this transformation.

■ Introduction

Older people form an increasing proportion of the global population and as society is reshaped, educationalists are challenged to consider how to respond to an ageing population through new pedagogies and practices of teaching, research and

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13. In this chapter, he develops the AFU theme from a previously published article (Mark 2018) which is listed in the references. This article is based on a presentation given at the University Association for Lifelong Learning (UALL) Annual Conference at the University of York, England in 2017.

   Overall, this chapter examines findings from a learning cities perspective which is the subject of this book. The chapter is tailored towards the needs of those working across sectors who are seeking to promote change. The two case studies in the publications are largely similar with some updates.

   See Justification Report by Volume-editors, for the substantiation of the contribution of this concluding chapter, representing a reworking of the author's research published in http://eprints.gla.ac.uk/158655/1/158655.pdf and https://www.tandfonline.com/doi/abs/10.1080/02601370.2016.1224040?journalCode=tled20

community engagement (Withnall 2002). Universities as major educational providers can and should adapt to fully address the challenges and barriers faced by older adults through the creation of appropriate opportunities for later-life learning. Universities have the potential to bridge disciplinary and geographic barriers to overcome the intellectual compartmentalisation that has often impeded later-life learning, research and practice (Field & Schuller 1999). In this article, the author outlines a vision for the development of later-life learning within the university using the concept and strategic focus of the AFU.

This chapter examines how two universities are engaging with older adults. It looks at how the universities have developed policies and practices to engage with the needs and interests of older adults and in so doing became more inclusive and age-friendly.

■ Generations of reflection and response around later-life learning

When seeking answers about how universities should respond to the needs of older adults, it is important to be clear about what the purposes of learning are as this ultimately influences the learning that transpires. Kjell Rubenson (1998, 2000) identifies an early generation of ideas about lifelong learning with its roots in humanistic traditions and utopian visions. This assumes that people live in a world where the individual is highly motivated to learn; constantly seeking new knowledge. These visions were followed by a new generation of ideas from the late 1980s of lifelong learning, which appeared to be structured around an economistic worldview. Here the focus is on supporting the needs of the economy, and education is therefore focused on providing training and qualifications to meet perceived labour market demand.

A further generation of concern has emerged based on the connections between learning and well-being. Older people are

more vulnerable to diminished health and well-being and may hold limited access to the learning and life skills necessary to stay well (Ludescher 2016; Schmidt-Hertha 2016; Selwyn et al. 2003). There are large political and pedagogical issues that must be considered by universities and communities engaged in later-life learning (Borg & Formosa 2016). Although our focus is on this fourth generation of concern around later-life learning and its potential for overcoming the hurdles between older adults and higher education, this chapter engages in advancing the argument.

Across these generations, we find the premise that learning throughout life is a human right as a cornerstone of adult education and later-life learning (Schuller & Watson 2009). This premise is held by this chapter's author drawing on lessons from those like Tom Schuller and Denise Watson (2009). They offer 10 proposals for upholding the human right to learn throughout life, but among their proposals are a call for the strengthening of choice and motivation to learn, a framework to give people control over their own lives as citizens, and strategising on local, regional and national levels. Modern learning theories and practice must do more to not see education as a commodity to be bought (Kolland, Ludescher & Waxenegger 2016). These notions can be seen in our principles for and work towards the AFU.

■ Principles for developing an age-friendly university

In 2012, the ministers of education from the 47 members of the European higher education area issued a proclamation that the student body entering and graduating from HEIs should reflect Europe's diverse population, from which a commitment was made that included a focus on the ageing population. The year 2012 was deemed the European year for active ageing and solidarity between generations (Withnall 2016).

The conceptualisation of the AFU began at Dublin City University. Together, researchers, adult learners and external partners representing older adults' interests developed 10 principles.

■ Age-friendly university principles

Age-friendly university principles include:

- to encourage the participation of older adults in all the core activities of the university, including educational and research programmes
- to promote personal and career development in the second half of life and to support those who wish to pursue 'second careers'
- to recognise the range of educational needs of older adults (from those who were early school-leavers through to those who wish to pursue a master's degree or doctorate)
- to promote intergenerational learning to facilitate the reciprocal sharing of expertise between learners of all ages
- to widen access to online educational opportunities for older adults to ensure a diversity of routes to participation
- to ensure that the university's research agenda is informed by the needs of an ageing society and to promote public discourse on how higher education can better respond to the varied interests and needs of older adults
- to increase the understanding of students of the longevity dividend and the increasing complexity and richness that ageing brings to our society
- to enhance access for older adults to the university's range of health and wellness programmes and its arts and cultural activities
- to engage actively with the university's own retired community
- to ensure regular dialogue with organisations representing the interests of the ageing population.

These principles set the challenge of incorporating the interests of older adults into a university's core teaching, research and engagement activities. The AFU is seeking to play a leadership role in strategically addressing the challenges of an ageing population through its research agenda, curriculum development, engagement with the ageing community and relationships with its own academic and support staff and students. This requires an interdisciplinary perspective harnessing the institution's expertise and resources to investigate and address older adults' interests in relation to larger societal issues. The AFU approach also includes intergenerational learning programming that brings together younger and older students, learning from each other for their mutual benefit (Corrigan, McNamara & O'Hara 2013).

The AFU represents one example of a strategic response on the part of higher education to the changing nature of the life course from a linear to a more dynamic and complex model. Increased longevity, coupled with the changing nature of work (that is, more IT and home-based), employment (insecurity) and family structures (more single households and 'patchwork' families) suggest the need for a new view on the stages of life.

The impact of the AFU's dialogue between universities and the germination of its principles within the universities remains uncharted. The word 'dialogue' is used to signal the fact that HEIs are places not only for the exchanges of thought, but also places for mutual learning (Kolland et al. 2016). Although in its beginnings, the stories show AFU's commitment at the highest level of these universities to widen the participation of older adults in universities, there is no single blueprint on how the AFU might be developed (Slowey 2018). This chapter will examine how the AFU concept has developed in two institutions: Dublin City University and the University of Strathclyde. There were three founding partners in the project, the third partner being Arizona State University. These universities are committed to promoting age-friendly initiatives and to sharing knowledge about progress in putting principles into practice. The partnership

has been extended to include other universities through a mutually recognised agreement.

This chapter focuses solely on two universities that adopted the age-friendly principles: Strathclyde University in Glasgow (United Kingdom) and Dublin City University (Ireland). These universities were chosen because the author was involved in developing and implementing principles and practices in both universities, where he worked as a teacher and researcher. Dublin City University is in a suburb of Dublin and close to Ballymun, one of the city's most disadvantaged housing estates. It does not have a centre or department of lifelong learning or later-life learning. Strathclyde University has had a centre for lifelong learning (CLL) from the 1960s where later-life learning programmes are located (through what was a senior studies institute, and recently renamed a later-life academy). Both universities seek to encourage adults from disadvantaged groups to attend programmes. In Scotland, the government provides a subsidy for students who have not studied at the same level before and in Dublin some assistance is given to students with limited resources. In both universities, the student cohort in later-life programmes are largely fee paying though the fee often does not reflect the true cost of provision. Student data on fees and social and community background were not available at the time of writing.

This synopsis will demonstrate how the two universities implemented an age-friendly strategy to engage with older learners and will draw conclusions on the extent to which these universities might be said to be AFUs.

The examples below demonstrate different and unique approaches that emerged in the search for what makes a university age-friendly. By providing two illuminating examples of how these universities are engaging with the concept of the 'age-friendly university', it is hoped that this in turn can provoke a discussion on how this concept might be harnessed to engage new groups of adults in universities.

■ Trends emerging in the implementation of an age-friendly university

In this section, the author discusses some trends emerging in two universities, the University of Strathclyde in Glasgow, and Dublin City University.

■ Strathclyde University

The University of Strathclyde is one of a small number of universities in the United Kingdom, which is placing a special focus on providing for the educational needs of older adults. The university's egalitarian ethos dates back to the late 18th century when John Anderson, the founding father, set out in his will a vision of a new democratic university with part-time education for non-traditional students, including artisans and women. The university's motto is 'a place of useful learning'. Through public subscription, the John Anderson University came into being – now the University of Strathclyde.

Inclusivity and community outreach have characterised the development of the institution. By the mid-eighties, the university embraced the learning in later-life (3L) idea based largely on the University of the Third Age. As it was the first targeted 3L-programme in Scotland, it gave birth to a wide range of teaching, research and practical activities targeted to the needs of older adults. The flourishing 3L programme was formalised by the institution as the CLL in 1996. A broad range of public programmes were offered, including languages, history, the arts and natural and social sciences at all levels, geared towards the needs and interests of older adults.

Currently, around 1500 learners aged over 50 are enrolled in targeted programmes. The learning programmes are wide-ranging and flexible, with a great many other non-formal activities such as self-help clubs and groups. Ongoing support and

encouragement are also provided for teachers and tutors through non-formal training and workshops, especially addressing how to develop better ways of learning. Not only was the initiative the first in Scotland, but it also remains one of the largest and most sustainable in Europe.

Centre for lifelong learning staff are often asked to identify the factors contributing to its sustainability, and three aspects have emerged. These are linked to the collaborative nature of the venture involving partnerships both within and outside the university to develop and deliver programmes, support for the work of CLL at the highest level and most importantly, the engagement of older students in decision-making and in the development of extracurricular activities through a student association, some of which are discussed further.

The centre, since the beginning, has developed initiatives that cultivated the context for the creation of the AFU concept and principles. Four arenas for innovative practices for older adult learning are described further.

Firstly, the programme offers bridges between generations enabling young people to learn from their seniors and vice versa. The intergenerational contact has been useful in promoting new images of both older and younger people, placing young people at the forefront of challenging ageism.

Secondly, the centre targets older adults in the 50- to 59-year-old age range recognising the burgeoning older adult population, in part brought about by employer restructuring and downsizing. For example, 1-day workshops, half-day taster seminars, study trips, summer courses and lunchtime talks were developed. Skills-based classes – especially in information technology – have expanded exponentially, both for personal enrichment, and also for work readiness. An overall uptake of optional university credits has also demonstrated that some students want official acknowledgement, while others have seen these as enhancing job opportunities.

Thirdly, another hallmark of the centre's development is that older adults have been integrally involved in defining its offerings. Despite the sociable nature of classes, it is the personal connection to each other that enhances the experience. Tutors are engaged for 3 h per class, two for teaching and a third for social interaction. Tutors and students mingle over refreshments in a pleasant room. This strategy enables barriers to be lifted and enriching relationships to thrive. A 3L student association was formed in 1998 and currently it has over 900 members. It organises social events including lunches, theatre trips and study weekends. It also supports 16 special interest clubs, which are open to those registered in the programme and who are student association members. It works in parallel with the classes to ensure formal learning is supported by informal activities. Furthermore, it helps to integrate students into university life, with members encouraged to take part in other events, such as university public lectures, intergenerational debates, concerts and art exhibitions. This involvement has raised the 3L student profile throughout the university, as well as engendering a sense of belonging to the university.

Fourthly, a host of older adult volunteer groups have been created to carry out the centre's mission. Examples include university guides (campus tours), computer buddies (one-to-one learning) and the spinal injuries support network (social support). These projects have allowed students to apply their learning and to benefit the community. The '50+ challenge', set up in 1997, supported students in their search for paid employment. One-to-one mentoring assistance with curriculum vitae writing and interview skills was supplemented with study for the European computer driving licence. Over the years, the centre has built considerable expertise in older adult employment, which is of increasing relevance.

Fifthly, pathways have been built to facilitate older adults' sense of belonging and access to university facilities. Such engagement has contributed to the programme's success through the range of informal activities running in tandem with

the volunteer projects. The work done includes mailing promotional material, assisting at open days, staffing exhibition stands, community group talks, conference registrations, cataloguing books, hanging art exhibitions and not least, welcoming visitors and new students to the programme.

In line with the AFU's mission, the centre has broadened its mission in two significant ways. Firstly, it has built significant expertise in employment and skills-related training to encourage older adults to improve career prospects. It has worked with employers, trade unions and other business organisations to explore productive and flexible ways of integrating and maintaining older adults in the workforce. Additional funding from the local authority and the European Union has largely supported these programmes.

Secondly, pathways have been developed for engaging older adults with the university's research agenda. Older adults are now engaging in research that will (1) inform the university's ambition to provide more responsive programmes for older people and (2) inform public policy makers about the educational needs of older people. An initial task was to prepare a historical record of the growth of provision for older leaners over a 25-year period, to review existing provision and make recommendations for future development from the perspective of these older learners. The research, all conceptualised and executed by older adults, has informed the development of many university projects on intergenerational learning and on the potential for older adults (grandparents and other community members) to contribute to children's learning. This new departure provides a way for learners to identify their own learning needs and to provide evidence on what works.

The importance of learning in later-life is now recognised as an integral part of the mission of the University of Strathclyde in its quest to enhance and promote active healthy ageing. It is also seen as an integral part of the university's strategy to widen access through encouraging older people from all backgrounds

to engage in formal and non-formal learning within a university context.

■ Dublin City University

Dublin City University is a young university with a distinctive mission, which aims to transform lives and societies through education, research and innovation. The university has responded to global challenges posed by demographic changes by becoming an 'age-friendly university'. In this regard, the university has built directly on its existing track record of research, educational innovation, widening access and community engagement in areas such as intergenerational learning, innovative delivery of lifelong education, health and wellness, social enterprise, support of non-traditional learners, careers, business and technology.

The AFU concept moved the university to a wider, strategic focus, incorporating the needs of older adults into the development of new opportunities and synergies locally, nationally and internationally. Under the auspices of the university president, a university-wide, interdisciplinary working group was established with the brief to engage directly with older adults and their representatives to identify ways in which Dublin City University, and higher education more generally, might best contribute to meeting their interests and short-, medium- and long-term needs. Those involved included older adult learners from the university's long-established intergenerational learning programme (Corrigan et al. 2013) and major agencies such as Age Action Ireland, Age and Opportunity, the (Irish) National Adult Learning Association, the Senior Citizens Parliament, the Retirement Planning Council of Ireland, the Third Age Foundation, prominent experts (that is, a social-gerontologist), University of the Third Age, various active retirement associations, representatives of the university's own retired community and relevant public authorities.

Dublin City University launched AFU in 2012 and incorporated the 10 principles into its mission. A subsequent age-friendly

implementation action team was established representing six 'pillars' of areas of work across the university:

1. research and innovation
2. teaching and learning
3. lifelong learning
4. intergenerational learning
5. 'encore' careers and enterprise
6. civic engagement.

This work was supported by the coherence of core strategies relating to educational innovation, widening access, civic engagement and research.

From a myriad of areas of development at Dublin City University, four are highlighted here as illustrative of the range encompassed under the AFU concept. First, lifelong learning was further developed through the offering of flexible learning programmes (part-time or e-learning, particularly at the postgraduate level), which address current research, identifying the challenges faced by relatively younger adult students (ages 30–50) engaging with full-time study (Slowey, Murphy & Politis 2014). For example, Dublin City University is host to Ireland's National Institute for Digital Learning. Also, the university offers shorter programmes to the Dublin community targeted particularly at widening access to adults who did not previously regard higher education as 'being for them'. Arguably, however, at the core of provision for older adults lies the university's intergenerational learning programme, which is directly centred on the identified needs and interests of older learners. This is not done in isolation, but in close collaboration with younger students with an educational approach designed to encourage each to learn from the other (Corrigan et al. 2013).

Secondly, the university has taken a lead in research on implications of specific aspects of ageing. For example, it has set a major focus on early onset dementia, getting involved with European Union projects such as In-MINDD (innovative midlife

intervention for dementia deterrence) and an elevator project supporting awareness raising and training in relation to dementia.

Thirdly, Dublin City University has developed programmes around health and wellness. The university hosts a MedEx programme, which under the care of a medical director, brings several thousand older adults to the university campus for a wide range of programmes aimed at supporting healthy living. Programmes include: HeartSmart – cardiac rehabilitation; BreatheSmart – pulmonary rehabilitation; SmartSteps – vascular rehabilitation; Diabetes health steps – diabetes; Move on – cancer rehabilitation and Living life – for people living with advanced/secondary cancer.

Fourthly, Dublin City University works to continue its collaborative research investigating learning among older adults. The use of innovative technology for learning holds potential for older adults who can otherwise be excluded from learning activities because of physical and social barriers. Working in partnership across a range of disciplines (i.e., technology, adult education and communications) and with other researchers internationally, universal design for learning explores the use of multiple representations of information through alternative modalities to create new interfaces to support older adult learning (Murphy 2015).

■ Conclusion and recommendations

The above examples highlight two distinct approaches used to promote AFUs. While both universities have engaged with older learners, the process has been triggered from quite different starting points.

In Dublin City University, an initial commitment from the president, who established an interdisciplinary partnership of senior people across the university to develop and promote an AFU policy, provided the initial impetus for engagement right across the university. In contrast, in Strathclyde, the impetus for

engagement came from staff in the senior studies institute located within the CLL. This unit worked in partnerships with older learners, through a student association (with over 1000 members), to develop a provision to meet older learner needs. Gradually, both universities have sought to develop working relationships and partnerships between senior and middle management, and the learners.

The opportunity to learn through participation in formal courses as well as non-formal learning activities was evident in both universities. In the case of Dublin, the focus has been on engagement of adults in an intergenerational learning programme bringing together students of all ages, for example, to share their personal memories through photographs and stories. The university also works in partnership with various subject disciplines to promote entry routes to established university courses.

At Strathclyde, the focus is mainly on formal programmes specifically tailored to the needs of older adults. Staff are trained to use teaching and learning approaches suited to the cohort group and to provide advice and guidance to older students. The student association organises non-formal learning activities to support formal learning through 'clubs' that are largely social and recreational in nature. In addition, there is a focus on voluntary activities which include supporting learners outside the university (in schools, hospitals and in the community), fundraising and assisting the university with relevant tasks, for example, tour guiding that shows groups around the university.

Both approaches have advantages and drawbacks, including the fact that students sometimes find it difficult to integrate in classes populated by younger students. On the other hand, programmes for older adults tend to be introductory and often non-accredited and do not provide opportunities for older adults who want to study at a higher level.

There are research and development activities in both universities, each with a different emphasis. Both universities were engaged

in research relevant to ageing – depending on the research interests of the university. Dementia, social care, nursing, prosthetics and orthotics are just some examples of areas where research related to ageing is taking place. The focus on an AFU has led to opportunities for collaboration both internally and through partnerships, which are now being further explored. In Strathclyde, a student research group has been set up that carries out its own research and assists with other research activities across the university. In Dublin, students have been encouraged to complete theses and projects in this area as part of their studies. So AFU is both supporting research and encouraging new cross-disciplinary research as a direct result of a focus on the AFU concept.

These case studies show how universities can embrace age-friendly principles and develop policies and practices that seek to bring about change by integrating older people into the life of universities and engaging in research that is relevant and useful to the needs of older people.

Universities are well placed to become leaders in addressing challenges. The AFU building blocks are both relevant and correctly targeted at promoting the quality of life of older adults. They are firmly based on a partnership approach involving teachers, researchers, community organisations and learners working together in the delivery of programmes and are part of an AFU age-friendly trajectory.

Enabling universities to become age-friendly will require nothing less than a cultural transformation in most HEIs. The challenges are clearly considerable for institutions, most of which are centred on the educational needs of young adults. However, the experience of some universities suggests that there is much to be gained from taking the first step to include new cohorts of older adults and to open a debate involving all those interested in including older adults in universities. In such debates, the voices of older members of society have a pivotal role to play in encouraging new approaches to inclusion in

universities. This debate inevitably raises questions concerning the role of universities in contemporary society and providing wider access to higher-level knowledge. The possibilities for mutual learning, dynamic development and innovative outcomes through involvement of people with different backgrounds and experiences will certainly provide new challenges and new opportunities for research and practice. Experience shows how HEIs not only need to consider alternatives to their many systems geared towards full-time and part-time learning, but they also need to look outside conventional benchmarks that fail to capture the rich and diverse activities encompassed within the vision of the AFU.

There are challenges in discovering the types of learning which many older learners seek as opposed to prescribing how they should learn (Kolland et al. 2016). They are firmly based on a partnership approach involving teachers, researchers, community organisations and learners working together in the delivery of programmes. Along with age-friendly initiatives in related areas (such as health and wellness, urban development, technological innovation and cultural activities), they are all part of what a new AFU trajectory might be. Perhaps if we can take the steps necessary to widen participation and open new opportunities for learning for all age groups, then a new culture of learning and research into lifelong learning will follow? If this follows, then perhaps we are on the brink of new discoveries making universities more 'age-friendly' and inclusive in the 21st century.

Achieving a university that is age-friendly in practice will require nothing less than a cultural transformation for most HEIs. The diverse voices of older members of communities have an essential role to play in bringing us back to central questions concerning the role of universities in contemporary society and issues of access to higher-level knowledge. The possibilities for mutual learning, dynamic development and innovative outcomes are considerable and the contribution to the community at large is immense.

In conclusion

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'Transformative change to build a better sustainable future requires the emergence of new practices and forms of partnerships that harness to deeper social forces' (OECD 2016:116). This book has signposted some of the practices, such as building a mindful learning culture, and some of the innovative forms of partnerships that connect urban and rural areas in new patterns of collaboration. The concept of entrepreneurial learning city regions illustrates such an innovation that will require the active participation of universities with a range of partners and mindset changes in giving effect to an appropriate philosophy and the role for universities in a world in deep transition.

The book covers both the international and South African contexts. The distinctive merit of the book lies in the way it combines the South African context with the wider international development context in ways so that there is a flow of information and ideas both ways. The book is an essential part of this sequence of ideas development and action at a critical time for strategic action directed at a sustainable future past the COVID-19.

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Chapter 11

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Conclusion

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Index

This book aims to demonstrate how a combination of globalisation, pandemics and the impact of innovation and technologies are driving towards a world in which traditional ideas are being challenged. It carries forward a dual context and relevance: to South African social, educational, economic and cultural development, and the broader international context and action directed towards how lifelong learning for all can be fostered in communities as a foundation for a just, human-centred, sustainable world. The distinctive contribution of this book to the production of a local development body of knowledge lies in the symbiotic relationships between these objectives, so that South Africa could serve as a test case in working towards approaches that have a wider international significance. The book is timely because of recent developments in each of these contexts; for example, rethinking the role of universities, their relationships with other stakeholders such as business, civil society and policy makers; rethinking the interface between urban and rural areas; and building connections at various levels that facilitate and support the aspirations of individuals. In conclusion, the book is action-orientated in its recommendations, which seek to empower scholars to implement or explore local development in their communities and work environments across areas of interest, such as higher education, the Sustainable Development Goals (SDGs), promoting lifelong learning opportunities for all, and many others, as well as generally encouraging partnerships for local development.

This book displays a comprehensive acquaintance with the present state of higher education and adult education in South Africa. There are emerging policies and demands at universities, like the need to support and enhance holistic views of development, embracing social equality and cohesion, environmental sustainability, health and well-being, and cultural vitality. At the same time, digitalisation means renewing competence and developing the skills involved in learning how to learn. The portrait of higher education and adult education in these uncertain times does appear challenged, but with new resources for resilience. The role of higher education is to offer knowledge, problem-solving competencies and digital skills to African learners to stimulate greater resilience in South African communities and cities. In this context, new learning means the ability to operate collectively in a creative and problem-solving manner. This book shows that the role of higher education is vital both in creating a resilient society and in digital transformation. This will be achieved with the support and engagement of higher education institutions that leverage and teach new technologies and strategies to adapt to the new normal. This well-written book contributes useful theoretical and practical case studies of the learning context in an era of digital transformation.

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