Higher Education: Collaboration between Universities

Chapter 4

The Role of Partnerships in Preparing Open Distance E-Learning in South Africa for the 4IR: A Case Study

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Introduction

The concept of the 4IR (Fourth Industrial Revolution) is gaining currency in numerous sectors including HE (higher education) (cf. for example, Van Heerden & Goosen 2020; Grinshkun & Osipovskaya 2020). The WEF (World Economic Forum) describes the 4IR as a combination of different technologies blurring the boundaries between the physical, digital, and biological spheres (WEF 2018). The term and its implications are attracting increasing attention from policymakers, business practitioners, and academics (Oke & Fernandes 2020).

The 4IR as a technical term has its roots in the early analysis of the evolution of technology, with the aim of improving human life in different stages of history. The 1IR (First Industrial Revolution) started around 1828. During this era, water and steam power were developed to set up more systematic and efficient forms of manufacturing (Elayyan 2021). After the 1IR, a vision for a new kind of curriculum in HE began to form, with more diverse degree options and new general education programmes designed to produce the required breadth of study by offering a variety of elective courses, leading to the 2IR (Second Industrial Revolution) (Penprase 2018). The proliferation of new educational institutions and curricula after the first two IRs (industrial revolutions) provided the extended technical and managerial capacity to implement the massive expansion of the economy and manufacturing that arose in the 20th century. With the 3IR (Third Industrial Revolution), access to HE increased even more with innovations in information and communication technology (Oke & Fernandes 2020), shifting the focus to active learning pedagogies that placed a premium on collaboration, accelerated by online technologies. Educational transformations from the first three IRs provide the necessary groundwork for potential transformations in HE in the 4IR (Mezied

2016). The term '4IR' was officially announced by Klaus Schwab, the founder and executive chair of the WEF in Davos, Switzerland in 2016 (WEF 2016).

With regard to education, the exact impacts of the 4IR on society and the planet are still unknown. Penprase (2018) reminds us that any educational plan for the 4IR must be built upon the results of the 3IR and its development of online instruction. This development has been accelerated by the Covid-19 pandemic that hit the world early in 2020 and made on-campus HE impossible for several months. New online distance education approaches to teaching and learning were needed as it was important to note that digital education is more than a purely technical concern, as online environments are changing the dynamics of how teaching and learning occur.

A well-developed 4IR form of HE will ensure that students will graduate into a world that they can help shape with the needed skills for the 4IR and the 21st century. These are strong social and collaborative skills, the ability to teach, and information and technology skills (Selamat, Alinda Alias, Norris Hikmi, Puteh, & Hamisah Tapsir 2017; Oke & Fernandes 2020). Oke and Fernandes (2020) conclude that the most important skills are the so-called four Cs: Critical thinking, collaboration, communication, and creativity. Yusuf and Busthami Nur (2019) add the importance of problem solving to the list. According to Woolf, Lane, Chaudhri, and Kolodner (2013), lecturers in HE need 21st-century skills that will assist students with self-direction, self-assessment, and teamwork. Waghid, Waghid, and Waghid (2019), as well as Dennis (2020), refer to lifelong learning – rather than completing a single qualification – as a vital skill for the 4IR. These skills were further highlighted in the 2019 Horizon Report, which identifies a demand for digital skills and fluency (Alexander, Ashford-Rowe, Barajas-Murphy, Dobbin, Knott, McCormack, Pomerantz, Seilhamer, & Weber 2019). Other skills are self-efficacy, autonomy and agency, self-motivation, creativity, communication and cooperation, and reflection, as well as a stronger focus on learner-centred, lifelong learning (Alexander *et al.* 2019; Ehlers & Kellermann 2019; OECD 2018; Redecker & Punie 2017).

However, for HE to provide future generations with the right skills and knowledge, an important question must be answered: How can HE institutions ensure that lecturers and students have these skills? One way is through partnerships between IHEs (institution of higher education), as a partnership 'encapsulates the belief that individuals and organizations can achieve more by working together (in partnership) than they can by working individually' (Dhillon 2009:687). Each partner contributes different merits that strengthen the alliance and make them all the more competitive. Partnerships can take many forms. One type of relationship between universities is driven by the professional development of staff members.

The purpose of this chapter is to explore how a partnership between two universities supports academics who are developing ODeL (open distance e-learning) in South Africa, with the 4IR in mind.

The Fourth Industrial Revolution and Partnerships

The South African DHET (Department of Higher Education and Training), in its Second Research Colloquium on the implications of the 4IR for post-school education and training (DHET 2019), acknowledged that the hallmark of the 4IR is exponential growth and rapid change, making it imperative to update curriculum content at an unprecedented rate to match the rapid tempo of scientific and technological advances.

A more responsive curriculum places an extremely high premium on faculty development and curriculum renewal (Penprase 2018). In the future, academics and students will never complete their education, but must constantly engage with their colleagues and outside experts to renew and update their skills (DHET 2019). To enable university staff to maintain their expertise based on the latest discoveries and technologies, more proactive and creative forms of staff development are required (Gleason 2018). One creative way to build staff capacity is setting up international partnerships between universities. Besides the obvious enhancement of capacity gained by exchanging knowledge and experience, partnerships offer access to innovations that may not be locally available, such as the use of the latest technologies in ODeL (Van den Berg, Joffe, & Porto 2016). Studies on the international cooperation between universities have shown that it is a powerful tool for academic development (cf. e.g., Berland, Richards, & Lund 2010; Sutton, Obst, Louime, Jones, & Jones 2011; Knobel, Simões, & De Brito Cruz 2013; Mayo 2014). Despite the existence of the above and numerous similar studies on international partnerships and collaborations, there is a lack of research into international collaborations intended to build academic capacity to prepare ODeL institutions for the 4IR. This chapter makes a contribution to this field.

The South African Context

The emergence of the 4IR, accelerated by the Coronavirus pandemic, has brought with it a rapid digital transformation in the HE sector. Changes in HE are therefore even more necessary than before and the challenges ahead must be considered to ensure effective, efficient, and immediate transformation (Suganya 2017; Abdulrahim & Mabrouk 2020; Mhlanga & Moloi 2020). However, despite the advances in technology, the HE sector has been reluctant to adopt it to facilitate teaching and learning (DHET 2019). Moreover, the use of technology has been predominantly limited to an instructional approach

in which teaching is facilitated with a personal computer and electronic teaching materials. However, as Oke and Fernandes (2020) argue, the use of digital technology, underpinning the 4IR goes beyond the use of computers and e-materials and should be compatible with a learner-centred approach for it to effectively enhance students' learning experiences. A recent South African study found that the HE sector is still unprepared for the 4IR, but that there are opportunities to harness its potential (Oke & Fernandes 2020).

UNISA (the University of South Africa), which provides the context for this chapter, recognises the realities of an ageing cohort of academics, the slow pace of transformation in the academic professions, the rapidly changing needs of students, and the new demands of the workplace related to the 4IR (Ng'ambi, Brown, Bozalek, Gachago, & Wood 2016). In an address entitled 'UNISA unpacks 4IR's future impact on higher education,' Prof Narend Baijnath, the CEO (chief executive officer) of the CHE (Council of Higher Education) in South Africa at the time, encouraged UNISA as a provider of ODeL to be fully aware of its role in society, and to deliver quality teaching by constantly adapting to the technological developments needed for the 4IR. He maintained that UNISA is the most important university in the country – not only because of its size, but thanks to its reach and the crucial role that it plays and has played historically in advancing social justice. Because it offers distance learning, UNISA can reach many students on the margins of society, including those who were disadvantaged in the past because of apartheid. In Baijnath's view, tertiary institutions should reskill or upskill to future-proof people's jobs and allow employees to do away with old technologies to better serve their communities. He warned, however, that traditional methods of teaching should not be rejected out of hand because the 4IR imposes certain limitations on HE (Baijnath, cited in Ravhudzulo 2019).

Although changes in the HE sector have been slow and inadequate (Gleason 2018; Mhlanga & Moloi 2020), the pandemic required of lecturers to gain the digital skills necessary to teach their students. The need for capacity building is therefore more crucial than ever.

The Unisa-University of Oldenburg Partnership

The success of ODeL teaching, learning, and research at UNISA, as the largest ODeL university in Africa, is largely dependent on trained, competent, and capable staff who can offer programmes within an ODeL context. To address the need to build academic staff capacity, UNISA signed an agreement with the Carl von Ossietzky University of Oldenburg in Germany, a young and innovative institution (established in 1973) which, according to its website, aims to find answers to the major challenges society faces in the 21st century. The University's C3L (Centre for Lifelong Learning) offers an online,

customised, graduate-level CAS (Certificate of Advanced Studies) in online teaching and learning to its staff as part of its international Management of Technology Enhanced Learning Master's programme (Universität Oldenburg 2021). This certificate feeds into UNISA'S Master of Education (MEd) in open distance learning, which accepts credits earned in the CAS. The CAS provides customised support to UNISA staff in developing the necessary skills and competencies to implement flexible and media-supported curricula and educational projects and programmes. The fully online programme is based on a systems view of education and prepares students to strategise and organise technology integration and transformation within their educational system and across the student life cycle, from curriculum planning and development to module delivery and evaluation. The programme draws on an international network of leading scholars and researchers in the field of ODeL who are skilled in the latest technologies in online teaching and learning.

The University of Oldenburg-UNISA programme follows a holistic systems approach built on the humanistic learning theory, where willpower and direction are determined by the student. Humanistic learning theory embraces academic learning, intellectual and personal growth, and the development of needed skills (Johnson 2014). Primary contributors to humanistic learning theory include Combs, Rogers, and Knowles, who all view self-directed learning as most facilitative of growth (Tolan 2017).

The University of Oldenburg-UNISA programme focuses on academic and professional staff capacity building in ODeL, which speaks to UNISA's mandate to respond to societal, public, and private sector needs, and ODeL as a way to provide the mass education needed in South Africa and Africa. The programme was developed in response to the growing need to advance excellence, innovation, and leadership in ODeL teaching, learning, and research at UNISA (UNISA 2018). It is intended to increase the national and international recognition of UNISA's contribution to ODeL theory and inform ODeL practice and policy development. The programme trains staff in ODeL pedagogy, policies, theories, technology, ethics and quality, and change and management skills, with a strong emphasis on research and an awareness of international and transnational issues in the field.

Since many academics are subject specialists and do not necessarily have the relevant educational background to teach online, the project envisages a growing ODeL teaching and learning capacity. To stay abreast of the latest pedagogies, technologies, and trends in ODeL at UNISA, the initiative, based on the partnership is grounded in the need to develop academics holistically to ensure that they can fulfil all the roles of a university (teaching, research, and social engagement). At the same time, the staff are engaged in dedicated, purpose-driven initiatives to build, maintain, and sustain cohorts of capable students who are ready for the challenges of the 4IR.

Theoretical Underpinning

We live in a knowledge society, which means that our lives focus on creating, communicating, and applying knowledge networks. According to Schutte and Du Preez (2008), knowledge networks imply a relationship between a number of actors and resources in which knowledge is captured, transferred, and created for the purpose of creating value. This study is therefore underpinned by connectivism, which involves making connections (as learning activities) and moving learning into the digital age (Siemens 2005). Learning takes place because and by means of connections that occur between humans and between humans and technology (Downes 2007). Connectivism is driven by the understanding that decisions are based on rapidly altering foundations and that new information is continually being acquired (Siemens 2005). Siemens (2005) and Downes (2007) developed this relatively recent pedagogical theory to understand learning in a digital and connected world. The connectivist learning theory has had an impact on teaching and learning practices, making knowledge distribution possible to all network members (Van den Berg 2017).

The instructional theory used to design and deliver the course modules for the CAS is based on the PAH (pedagogy-andragogy-heutagogy) continuum, which has a strong focus on building students' capacities and skills as self-directed and self-determined learners, moving them from passive forms of learning (pedagogy) to more active, learner-centred, and learner-driven learning (andragogy and heutagogy) (Blaschke & Marín 2020). A key aspect in the PAH continuum is learner control, suggesting that within heutagogy, which can be regarded as an extension of andragogy, the learner has developed control over using the affordances provided by modern technology and increased access to information and the sharing of information (Blaschke 2019). This instructional approach aligns well with a humanistic approach, as well as with the South African context, specifically in developing lifelong learning skills as part of the country's National Qualifications Framework (Kanwar, Balasubramanian, & Umar 2013).

Methodology

Working from an epistemological connectivist position, a narrative research approach was used in this study (Henning 2004). According to Lieblich, Tuval-Mashiach, and Zilber (1998), narrative research uses or analyses narrative materials. Webster (cited in Lieblich *et al.* 1998:2) identifies a narrative as a 'discourse, or an example of it, designed to represent a connected succession of happenings.' Data are regarded as socially constructed. Narratives provide the narrators with the opportunity to reflect on and discover their inner

selves and share their experiences over a period of time (Clandinin & Connelly 2000:16).

Given the advantages of narrative research in terms of the aims of this research, the case in this study was the first cohort of academic and professional staff (hereafter referred to as participants) who were enrolled in the programme and were completing their third module at the time of the research. The participants were asked to write a brief narrative of their experiences of the CAS. This was an open question to determine the benefits of the programme and possible challenges they experienced during their course of study. The 17 students who were enrolled were asked to write down their experiences and send this via e-mail to the researcher, and 13 narratives were received.

In addition, course evaluation feedback on the impact of the certificate on their professional environment was analysed and included to supplement the participants' narratives. The responses received were as follows: Principles, theory and practice of TEL (Technology-enhanced Learning): Four evaluations; Learner Support in TEL: Four evaluations; Design of TEL Environments: Six evaluations; and International and Transnational Education Issues in Technology-enhanced Learning: Four evaluations. Two participants were from student support services and the rest were from academic departments in various colleges of the university and were thus directly involved in teaching. Their experience in the online teaching environment varied from three to 18 years.

To analyse and interpret the data, the six-phase thematic approach of Braun and Clarke (2012) was used. The study had ethical clearance and was guided by the three fundamental principles of ethical research: Beneficence, respect for an individual, and justice (Markham & Buchanan 2012). Trustworthiness was adhered to by following the principles of credibility, transferability, dependability, and confirmability (Lincoln & Guba 1985).

The Content of the Online Teaching and Learning Certificate of Advanced Studies

The certificate consists of four fully online semester modules, to be completed over a period of two years. The focus of the four modules is as follows:

Principles, theory, and practice of technology-enhanced learning

This module focuses on the history and evolution of distance education and technology-enhanced learning. Social and political/economic factors, theories, learning and teaching models, technology and media innovations, institutions and systems, and major writers are critically examined. A variety

of technologies are used to support the development of foundational skills and a personal learning environment that are integral to current practice.

Learner support in technology-enhanced learning

This module introduces the theories and concepts of support for learners in technology-enhanced learning environments. Various types of learner support are examined. Management issues to meet learners' needs and serve special groups, and evaluation and applied research are also covered.

Design of technology-enhanced learning environments

This module addresses using digital media in different educational settings. It looks at the psychological processes of perception, understanding, and learning when using educational technologies, with a focus on multimedia and instructional design for online learning systems. Hands-on experience with several multimedia applications is provided. Topics include collaborative learning technologies, open educational resources, the impact of multimedia on learning outcomes, methods of multimedia evaluation, quality assurance, and the project management of e-learning initiatives.

International and transnational education issues in technology-enhanced learning

This module examines the development and current landscape of global ODeL in developed and developing countries. Key topics are cross-border partnerships, emerging business models, academic quality, cultural and linguistic opportunities and challenges, and the innovative packaging of content. Additionally, the module compares and contrasts key global professional and international associations, the resources offered by these organisations, and their diverse roles in promoting internationalism, global trade, and the quality assurance and management of global educational services. A major theme of the module is providing examples and case studies for comparative analyses from a variety of ODeL providers in developed and developing countries.

Course Design and Instructional Approach

Each course module is 15 weeks in length, with 12 weeks for course delivery and instruction and three weeks for students to prepare a final portfolio for assessment. The modules are designed to meet the needs of working adults, with each module requiring 10 to 15 hours of study time weekly. In addition, the modules are customised for UNISA and the South African context, specifically by using case studies, research, and examples that are applicable to this university.

The modules are delivered using C3L's online learning management system, C3LLO. The course content and discussion forums are also available

on an app that allows students to have content and discussion topics available offline. As the course modules are entirely online, face-to-face attendance is not required. Discussions are mostly held asynchronously, with learner support offered both synchronously and asynchronously. All course materials are available as OERs (open educational resources) on the C3LLO platform.

The courses are presented by world-renowned academics. Each course has a primary instructor and a mentor, and in most, a scholarly expert visits the course. This approach gives the students the opportunity to learn from and engage with an international body of staff and a global network of professionals and scholars in the field of ODeL.

As indicated earlier, the instructional theory applied in the course modules is based on the PAH continuum. The students complete learning activities that are assessed as a pass/no pass. This approach gives students an opportunity to recover from a failed assignment and receive formative feedback from the instructor, which helps them improve their submissions throughout the semester. In addition, the instructors offer the students a choice of assignment topics and sometimes of assignment approaches, allowing them to incorporate their own interests and professional context in responding to the assigned activity. The results of the learning activities are then fed into a final portfolio, which is the student's primary form of assessment, and developed online (Blaschke & Marín 2020). This form of authentic assessment gives students an opportunity to critically reflect on their learning experiences and to organise and showcase their accomplishments and acquired skills. The instructors work closely with the students, scaffolding their interactions, and encouraging self-direction and self-determination.

Findings and Discussion

During the data collection and analysis process, the following themes emerged. They are discussed below:

- Experiences of online teaching and learning and related technologies.
- Student support.
- Collaboration.
- Research.
- Application in professional practice.

Experiences of Online Teaching and Learning and Related Technologies

Participants had different experiences of the knowledge and skills in online teaching and learning that they had gained and the technologies they were exposed to. One participant, who had not studied in an ODeL environment before, remarked: 'This is the first time I'm studying anything online in distance

education, and that on its own has been and is a wonderful but challenging experience.' Another inexperienced lecturer participant wrote: 'I am fairly new in academia; this is my third year. A lot of literature resonated with my own situation and made me realise that UNISA benefits a great deal by having lecturers who are schooled in ODeL principles.' Many of the narratives referred to the exposure to different technologies, in some instances in the South African context. For example, one participant stated: 'I gained insight in the history of ODL theories, practices and research skills. I was able to develop insight and awareness of the importance of the dire need for open distance learning within the South African context and how best the knowledge gained can be used to enhance the required teaching and learning skills with the goal of offering the necessary support to students with better focus. I experienced the course as very critical in empowering and preparing us as upcoming academics for the challenges of the use of technology in facilitating teaching and learning, as well as how to address the societal inequalities, including the current curriculum transformation demands.'

Further references to technologies included the use of multimedia resources, exposure to online learning platforms, knowledge of OERs, MOOCs (massive open online courses), the flipped classroom, and different tools to enhance learning in an ODeL context. With reference to the application of knowledge and skills gained, a participant stated: 'I was able to implement some of these tools in my modules and my view on teaching has changed significantly.' This means that participants were able to transfer the knowledge and skills to their own teaching environments, to the benefit of their students.

The participants also showed their appreciation for the opportunity to study at an international institution and to learn more about technology-enhanced learning. One referred to 'a deeper understanding of online learning and the underpinning theories,' while another participant referred to the students he was teaching: 'The programme has improved my online teaching and learning knowledge to teach our students.' Another participant wrote: 'I found that the course through the University of Oldenburg has really set me up as both a scholar and practitioner in open distance e-learning. In working through the modules, I have come to understand the major theories that underpin and inform distance learning and use these to reflect on my own teaching at a HE institution.' The findings above concur with those of Selamat *et al.* (2017) as well as Oke and Fernandes (2020), that the skills needed for the 4IR are, among others, information and technology skills and the ability to teach others.

Student Support

Student support was regarded as important, as eight students mentioned that the certificate had highlighted how this could be improved. One participant wrote: 'I have learnt a lot and would like to put some of the elements of learner support and striving to be student-centric into practice for the benefit of students and the institution.' Another participant commented: 'What is most interesting for me is the aspects of learner support, which as far as I am concerned is a weak area…This has made me interested in wanting to design a framework for learner support in my modules.'

The participants mentioned that they had learned about various forms of student support and what could be done at their institution to improve it. One of them stated: 'The course helped me to understand our students and how they can be supported.' In this regard, Waghid *et al*. (2019) refer to lecturers needing to support their students in gaining lifelong learning skills. Furthermore, Woolf *et al*. (2013) refer to the skills students need to be taught by lecturers, such as self-direction and teamwork.

Collaboration

The theme of collaboration on different levels was interesting. It seems that the certificate created an awareness of how participants could work together. Although there are diverse descriptions of what collaboration entails, it can be defined as constructively working with others (Knight & Yorke 2004) and working in a group to achieve a common goal, while respecting each individual's contribution (Ellis & Han 2021). Regarding collaboration with peers, one participant wrote: 'I will definitely be considering collaborations with fellow students in future,' and another stated: 'The course creates awareness of existing research opportunities and possible peers' collaborations and created interaction opportunities with other senior scholars in the field of ODeL I was exposed to in this course.' This finding is supported by Oke and Fernandes (2020) as well as Yusuf and Busthami Nur (2019), who point out the importance of collaboration and teamwork as skills needed for the 4IR.

A few participants showed their appreciation for the opportunity to collaborate and showed a desire to share what they had learned. They were positive about their connection with colleagues at Oldenburg University. As one indicated: 'The lecturers in the course were excellent. This was indeed modelling distance education. We interacted with them as if we have met them. They were very supportive and skilled.' Another participant reported that she was able to interact with her classmates and that the connection with her instructor and visiting experts gave her a good example of distance education practices in the internet space.

Research

The fact that participants mentioned research in their narratives, shows that they were interested in the scholarship of teaching and learning by writing down the knowledge and skills they had gained from their experience. One participant mentioned that he was involved in two research projects related to his studies at Oldenburg University, while another mentioned that 'the course creates awareness of existing research opportunities.' Another mentioned that she had 'submitted a draft ODeL article to a colleague,' while two participants indicated that they had submitted papers to be presented at an ODL conference.

Referring to the exposure to research in the programme, a participant wrote: 'The cutting-edge research that we were exposed to in this course already provided me with ideas on how to approach research, as well as ideas gained from interacting with our guest lecturer who is an expert in ODeL student support.' The research that participants were either planning or had conducted, relates to the critical thinking and problem-solving skills needed for the 4IR, as mentioned by Yusuf and Busthami Nur (2019).

Application in Professional Practice

The students noted numerous opportunities to apply their newly acquired knowledge within their professional environments. The ability to apply knowledge to unique environments is an important indicator of student competence and capability, one of the desired outcomes in self-directed and self-determined learning. Examples of participants applying their knowledge included the following: 'The course has been very useful for me. It made me confident to represent my university. I am now well informed about the history of distance education and what it is all about, specifically within our own socio-political context. More importantly, I have developed empathy for my students as an academic. Lastly, in my new role as a curriculum transformation specialist where I am supposed to guide academics on curriculum transformation, I am confident that I will perform this role as I know what to do when teaching and learning in distance education;' 'I am already using the information gained in this module in writing my new study guide which will be offered next year;' and 'I will incorporate new knowledge into my subject-related research. I will be improving my feedback to students.' Another participant, who was teaching in the College of Law, said, 'This course, and the certificate as a whole, has improved all aspects of my performance. My own teaching has improved. I will be starting research in online teaching and learning in South Africa, as directly related to my field. A rich body of work exists on legal education, but no one has written on TEL in South African legal education. I hope to take the gap and publish first before

anyone else is inspired by their experience of remote teaching as a result of the pandemic. Also, I am inspired to complete a PhD in TEL, not law!' The latter was particularly interesting, as this participant's learning went beyond the certificate, showing the aspiration to publish and attain a doctorate in the field. In this regard, Waghid *et al.* (2019) and Dennis (2020) refer to lifelong learning, rather than completing a one-off qualification as a vital skill for the 4IR. All the participants in this study already had at least an Honours degree and voluntarily enrolled for the CAS, indicating that they possessed this skill.

Participants further indicated their intent to apply their knowledge in practice, by referring to creativity and problem-solving skills. These skills were mentioned by Yusuf and Busthami Nur (2019) as well as Ehlers and Kellermann (2019) as necessary skills for the 21st century and the 4IR. As an example, a participant said: 'The website review activity took a lot of time to think out of the box but it was very informative at the end. The nature of the activity required problem-solving and enables deep learning. I will definitely be using this type of activity for my students.'

Conclusion

The purpose of this chapter was to explore the possibilities of a partnership between two universities to support academics in ODeL in South Africa, with the 4IR in mind. The findings show that partnerships have the potential to assist lecturers in gaining the necessary skills needed in HE for the 4IR. Online teaching skills and the use of appropriate technologies are necessary for important skills associated with the 4IR, such as collaboration, digital skills, and self-efficacy. These skills entail a connectivist rather than an instructivist approach to teaching, which leaves the door open for more innovative and flexible ways of becoming. In supporting students, they are taught skills such as self-direction, lifelong learning, teamwork, and digital skills. In this partnership, collaboration on different levels played an important role and led to future research and connection opportunities with peers, internationally as well as locally. Relevant ODeL research opportunities emanated from this partnership, leading to reflection on teaching practices in ODeL. Perhaps most important was the ability to apply new skills to a different context. This partnership enabled academics to apply the knowledge and skills they have gained to their own unique contexts, including their lifelong learning, creativity, and problem-solving.

The findings confirm that the skills that academics require cannot be taken for granted and that professional staff at IHEs have to be trained in the knowledge and skills needed to teach our students, who have to be knowledgeable citizens, as the era of the 4IR will bring great changes to what is necessary to function in the knowledge society. Although the study

identified ways in which participants were able to apply their knowledge to their current practice, it did not explore the impact that the training had on their teaching. Further research is therefore needed in this area.

Lastly, the first three IRs provided evidence of profound shifts in education, which resulted in a gradual proliferation of curricular innovation and the establishment of new educational institutions. Unlike the previous three IRs, the most important effects of the 4IR on our society may be realised very rapidly, mainly because of the demand for technologies and innovation in ODeL as a result of the Covid-19 pandemic. The 4IR displays the impacts of several compounding, exponentially expanding technologies that all share the capacity for rapid change, demanding a proactive response from the educational sector to train students who will be able to leverage the opportunities provided by the 4IR. Opportunities such as the partnership discussed in this chapter should be used to reach these goals.

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