Resilient Transformation of Studio-based Teaching and Learning in Creative and Design Disciplines towards Cognitive Apprenticeship

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Abstract

New challenges present new opportunities for curriculum innovation and transformation. The immediate health crisis in South Africa necessitates a swift but resilient response by Higher Education Institutions to save the 2020 academic year, with many institutions shifting their mode of teaching from face-to-face to online. Creative and design studio-based modules might face more challenges with this shift in the mode of delivery. These modules still rely heavily on teaching project-based modules through the master-apprentice model in studio environments. However, such a transformation to a virtual learning environment requires the 'master' to recognise the role of theory and evidence-based design activity to transform learning in these disciplines. The cognitive apprenticeship model has many similarities to the master-apprentice model, but it promotes the necessary power shift from the 'master' to the student. Such a pedagogical shift requires a collaborative, responsive, resilient and creative approach with deep empathy for both the student and 'master' to ensure the upholding of the integrity of the curriculum as well as the future employability of students graduating at the end of the academic year. This chapter reflects in and on the action of the curriculum transformation response implemented in studio-based modules at a local Higher Education Institution in South Africa. The global health crisis started the conversation of a pedagogical shift in studio-based modules, but it forced South African design educators to have a hard look at the way design has been taught in South Africa.

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Introduction

New challenges present new opportunities for curriculum innovation and transformation. The creative and design disciplines still rely heavily on teaching project-based modules through the master-apprentice model in studio environments. This model focuses on the craftsmanship of designers to create aesthetically pleasing objects/outcomes which often results in spending too little time on developing 21st-century skills (Norman 2016: 343). The discipline of design evolved from its craft-based origins (*cf.* Buchanan 2001: 5) into a powerful way of thinking and solving 21st-century problems such as sustainability and the improvement of people's lives (Dorst 2019: 118; Norman 2016: 343). However, the education of designers in project-based modules in South Africa, and even Africa, somewhat trailed in adjusting to these new requirements since the 'masters' often cannot articulate, or may lack the guiding principled knowledge that informs their actions to their students (Frascara 2007: 61, 67; Norman 2016: 343). Design education has evolved over time to address the needs of industry and society, but it needs continuous change to keep up with the ever-changing and challenging world (Noël 2020: 6). Researchers such as Don Norman, Ken Friedman, and Jorge Frascara are avid critics of design education (Noël 2020: 6), but often the action required to make the necessary transformation is slow, such as in most studio-based modules in design education in South Africa. The immediate health crisis in our country necessitates a swift response and challenge these conventions to shift the pedagogical approach in these disciplines to a more suitable teaching and learning approach for a virtual learning environment.

This chapter reflects on the thinking (in and on action) of the curriculum transformation of project-based learning in studio environments in creative and design disciplines from face-to-face to online learning to avoid a standstill of the education system at a specific private Higher Education Institution in South Africa. However, not all Higher Education Institutions in South Africa agree that it is possible to teach studio-based curricula online, due to the inherent limitations of the teaching approach as with other disciplines which is patient- or laboratory-based (*cf.* University of Witwatersrand 2020: online). The chapter starts by interrogating the nature of the master-apprentice

model and other traditions in the education of creative and design disciplines. The theoretical framework that frames this study is the cognitive apprenticeship model as guiding learning theory, project-based learning and social constructivism. This chapter reflects on a new way of thinking about studio-based modules in creative and design disciplines by pushing the boundaries for project-based learning in a virtual environment within the minimal timeframe. The lessons learned during this time will most likely change the way that studio-based curricula can be taught in future as well as how the knowledge gained through this reflective practice can be extended beyond the creative and design disciplines to other disciplines in the Humanities and beyond.

The Theoretical Underpinning for a Pedagogical Shift in Creative and Design Education

Most design courses, except for architecture, were originally presented as part of the Fine Arts at traditional universities (Buchanan 2001: 5), with South Africa being no exception. Lange and Van Eeden (2016: 67) point out that in the eighties, design courses at universities mostly excluded students of colour as a result of segregation policies. During this time, vocationally orientated design diplomas were presented at South African Technikons. The programme design of such qualifications dictated to students to master the techniques and skills of a vocational occupation (e.g. graphic design) (Council of Higher Education 2004: 8), which resulted in the training of designers rather than the educating of lifelong learners (Frascara 2007: 67). This approach to design education rippled through the education system, with many young 'masters' appearing on the scene in the post-apartheid years in the restructured Higher Education system in South Africa. However, design is not merely about creating aesthetically pleasing objects (Norman 2016: 343), but is rather the 'human power of conceiving, planning, and making products that serve human beings in the accomplishment of their individual and collective purposes' (Buchanan 2001: 9). Design programmes need to evolve so that they can equip current students with 21st-century skills, including creative problem-solving abilities for a changing industry entering the fourth industrial revolution, where many crafting skills would be replaced by artificial intelligence (Van Zyl 2019: 3; Verganti, Vendraminelli & Marco 2020: online). In the past, the design product or outcome overshadowed the process in design education;

however, the literature reports a shift in importance to the design process and sense-making (Alexander 2008: 10; Cassim 2013: 192; Verganti *et al.* 2020). Dorst (2019: 122) suggests that designers need to shift their thinking beyond the problem-solving paradigm to a new paradigm of complexity theory and systems thinking when they are faced with truly complex problems, such as the current global health pandemic.

The local creative and design disciplines still rely heavily on teaching studio-based modules through the master-apprentice model. This model originated in the years preceding widespread access to higher education in various sectors including trade and craft, with many masters only teaching apprentices how to become blacksmiths, painters, and sculptors, to name but a few. The 'master' is extremely good at doing, but often cannot articulate the guiding principled knowledge which informs their actions to their students (Frascara 2007: 61; Ghassan, Diels & Barrett 2014: 252). Creative and design students start their apprenticeship learning journey through observing the master's execution and then thereafter model or imitate their actions (Collins, Brown & Newman 1987: 3; Frascara 2007: 64). The aesthetics of the execution of the student (apprentice) in these disciplines are evaluated by the 'master' who is regarded as an expert or connoisseur, with focus on crafting skills (Ghassen *et al.* 2014: 252; Norman 2016: 343). This results in creatives and designers who do not possess the skillset for lifelong learning, or whose knowledge is limited (Frascara 2007: 61; Norman 2016: 343). The South African Qualification Authority (2000: 14) prescribes that any registered qualification in South Africa should have both specific and critical cross-field outcomes that promote lifelong learning such as solving problems, working collaboratively, communicating effectively, being a responsible citizen and so more (The South African Qualifications Authority 2000: 18-19). It is clear to see that the traditional master-apprentice model lacks many of the skills to promote lifelong learning. This, however, does not mean that we need to 'throw out the baby with the bathwater' since the model still has value in studio-based modules. However, the traditional model needs to be transformed to educate creatives and designers rather than train them (Frascara 2007: 67; Norman 2016: 343).

The transformation of creative and design curricula requires the 'master' to recognise the role of theory and evidence-based design activity to transform learning in these disciplines. On the other hand, design curricula have to cater for the widened domain of design and the role designers can play

as creative thinkers and problem-solvers in society (Buchanan 2001: 9; Norman 2016: 344) for wicked problems such as the United Nations Sustainable Development Goals of 2030 and the global pandemic of COVID-19. The curriculum design team needs to consider the pedagogical approach to promoting such a transformation. Cognitive apprenticeship, originally coined by Collins *et al.* (1987), could be such an approach and creates learning experiences for students to learn specific techniques or methods in diverse circumstances to build the layers of complexity, rather than using learning experiences from the demands arising from the workplace (Ghassan *et al.* 2014: 253). The cognitive apprenticeship model exists of six steps, namely modelling, coaching, scaffolding, articulation, reflection and exploration (Collins 2006: 49; Collins *et al.* 1987: 2-3, 16). The transformation from the master-apprentice model to cognitive apprenticeship might not be too challenging. The two pedagogical approaches overlap in their modelling, coaching and scaffolding teaching activities, but cognitive apprenticeship deepens the education of 'apprentices' through additional teaching activities (i.e. articulation, reflection and exploration) (Collins 2006: 49; Collins *et al.* 1987: 2-3, 16). The cognitive apprenticeship model was originally developed to teach mathematics, reading and writing (Collins 1987: 1), but over the past few years it has been applied to a variety of disciplines, including that of creative and design education (*cf.* Ali, Tahir, Said & Tahir 2015; Rodríguez-Bonces & Ortiz 2016; De Bruin 2019; García-Cabrero, Hoover, Lajoie, Andrade-Santoyo, Quevedo-Rodríguez & Wong 2018; Lyons, McLaughlin, Khanova & Roth 2019).

The curriculum transformation also needs to promote a shift in power from the 'master' to create a teaching-learning partnership between the 'master' and 'apprentice' (Collins *et al.* 1987: 3; Frascara 2007: 64). The 'master' articulates the guiding principled knowledge which informs their actions to their students to solve problems (Collins *et al.* 1987: 3; Frascara 2007: 61). The cognitive and metacognitive knowledge embedded in the cognitive apprenticeship model enables students to become reflective practitioners that can self-monitor and self-correct, opposed to a duplicate of their 'master' (Collins *et al.* 1987: 3; Frascara 2007: 67). Thus, the focus shifts to the promotion of independence in learning rather than dependence on the teacher (Alexander 2008: 10).

In addition to the master-apprentice model, most studio-based modules follow a project-based learning approach. Project-based learning is an ideal

approach in the creative and design disciplines, since it supports traditional pedagogy of the master-apprentice model as well as the development of the student within the learning theory of cognitive apprenticeship (Lokey-Vega, Williamson & Bondeson 2018: 329-330). Students need to apply their cognitive and metacognitive knowledge to a specific context to solve a problem (Bell 2010: 40; Lokey-Vega *et al.* 2018: 330). Project-based learning also provides creative students with a voice for the choices they made during the design process (Frascara 2007: 65; Lokey-Vega *et al.* 2018: 330).

Project-based learning aligns with Dewey's experiential approach to teaching and learning (Lokey-Vega *et al.* 2018: 329), which describes a partnership between the teacher, student and curriculum (Carl 2012: 45,51). Dewey (1902: 11) states that a curriculum represents a process of continuous reconstruction, which moves from a person's early-age experiences into organised bodies of truth called studies. The various study areas in a curriculum provide the experiences which are the essence of the educational race (Dewey 1902: 12). Dewey's experiential approach aligns with the social constructivism view of other theorists such as Lev Vygotsky, Paulo Freire and Jean Piaget (Lokey-Vega *et al.* 2018: 329; Ornellas & Muñoz 2014: 60; Picciano 2017: 170; Wrenn & Wrenn 2009: 260). The social constructivism approach is concerned with 'changing educational practice to foster active learning and genuine understanding' (Gordon 2009: 50), that supports the concept that knowledge is created as a result of a 'shared process of enquiry and creation' (Wrenn & Wrenn 2009: 260).

The Phenomenon of Shifting to Online Teaching as a Result of COVID-19

As a result of the COVID-19 situation in South Africa, a private Higher Education Institution had to move studio-based modules online for multiple disciplines (e.g. Graphic Design, Interior Design, Copywriting, Fashion Design, Digital Design, Game Design and Development and Creative Development) taught at various levels (e.g. Higher Certificate, Degree and Honours levels) and offered on several campuses across the country. These shifts were necessitated by the principles of social distancing and different levels of lockdown that limited movement and face-to-face teaching. This change had to be guided by the institutional management within institutional and governmental policies to promote academic rigour, equity of delivery

across all campuses, and to ensure that the outcomes of the curriculum are still met and guided by the principle that no student will be left behind. Dr Blade Nzimande (2020: 2) announced the shift to multi-modal higher education on 30 April 2020 with two overarching themes: #SaveTheAcademicYear; #SaveLives. All institutions had a compulsory three-week recess to start conversations and preparations for all stakeholders (students, lecturers, sponsors, parents, third-party suppliers such as software providers and the workplace industries).

Many students at private higher education institutions share similar challenges when shifting to online learning as students at public institutions. The process started with an evaluation of student and lecturer access to hardware, software and data. A flexible academic delivery plan was devised to accommodate students with different levels of access and circumstances by realigning assessments for the first semester to accommodate this shift, with the possibility of adopting this approach for the second semester as well. Most studio-based modules offered had already been taught before the lockdown by means of a blended mode of delivery using a learning management system to provide the framework and structure needed for online teaching. Lecturers received training and support to use online teaching tools with which they were unfamiliar. Students received orientation, training and instructional material in the form of how-to-guides in preparation of the shift to the online virtual space. Emotional support structures were strengthened to assist lecturers and (especially) students with this transition, as well as with other possible emotional issues which might surface during this period.

Although most studio-based modules were originally designed for a blended mode of offering, the transition to fully online required of the academic team to rethink what content should be delivered to still meet the required outcomes of the curriculum, how it should be assessed to measure these outcomes, the student experience and interaction with the curriculum during this period, and the shifting role of the lecturer and student. Some modules in this space faced additional challenges such as the use of specialised licenced software, big files, high performance hardware, access to specific sites or contexts (e.g. Interior Design), art materials, printers, photography studios, special paper or tools (e.g. Fashion Design, Photography and Drawing), live models for drawing and several real-life clients for collaborative project briefs. In fact, many of the traditional processes and delivery approaches used in these studio-based modules had to be adjusted, with the lecturer and student relation-

ship at the centre. Student and lecturer workloads had to be considered and adjustments had to be made, not only in the size and scope of project briefs but also in the pacing. The semester was also extended by two months with each assessment's deadline structured to allow students to proceed at their own pace.

The COVID-19 crisis is therefore seen as a critical incident or change moment that necessitates the rethinking of conventions and traditions of project-based studio learning and thus provides the research opportunity to document this process as research in- and on-action with the authors as active participants. The next section reflects on present actions and decisions taken during the phenomenon, with a link between thinking (informed by the theoretical framework) and doing (actions were taken) (Schön 1987: 31).

Discussion and Reflection-in-action during the Phenomenon

The shift from the face-to-face studio environment to an online virtual space not only necessitates reconsidering the use of resources and deliverables, but also the way learning takes place. Although the generation of students attending Higher Education now is considered by some as digital natives, in South Africa the digital landscape is quite unique. In classes, we can often find extremes amongst students who are absolutely novice tech-users (switching on the computer, opening a programme, using the internet) to advanced users that use technology fluently. However, the digital migration is being accelerated during this extreme time in the history of the world. With education globally moving to the online virtual space 'the need for online access and devices in every home is now so dire that it may finally mobilize society to treat internet connectivity as a must-have rather than a nice-to-have' (Sal Khan in Sullivan 2020). South Africa's internet penetration remains low, with only 54% of the population being connected to the internet (De Villiers 2017). Almost 93% of active internet users in South Africa use their mobile phones, which is not necessarily a smartphone, to access the internet (Harrison 2019).

The nature of such a pedagogical shift needs a creative, resilient, responsive and supportive virtual learning environment to overcome the barriers of the social distancing requirements during COVID-19, while ensuring that no student gets left behind due to limited access to the online virtual spaces or other COVID-19-related reasons. Such a shift in the learning environment is open for critique, and not everybody agrees that studio-based curriculums can be taught online, sharing inherent limitations with patient or

laboratory-based curriculums (cf. University of the Witwatersrand 2020). Technology and pedagogy play an important role in empowering students in online learning environments since they can overcome many of the limits of the traditional classroom (e.g. timetables of classes, knowledge at a press of a button, authentic experiences and so more) (Fullan & Langworthy 2014: 4; García-Cabrero *et al.* 2018: 2). Although technology offers an alternative to avoid an educational standstill, online instruction needs to be properly grounded with a learning theory such as the cognitive apprenticeship model to promote student engagement, as opposed to merely uploading content online for students to access (García-Cabrero *et al.* 2018: 2, 19; Selwyn 2016: 1006). An online learning environment that supports the cognitive apprenticeship model needs to be designed with sociological context of the field, use sequencing of tasks with increasing complexity and diversity, include relevant knowledge content, and apply the steps of suitable learning theory (Collins 2006: 48; Collins *et al.* 1987: 14-20). Several authors have explored the move of project-based learning and cognitive apprenticeship to an online learning environment (*cf.* García-Cabrero *et al.* 2018; Heo, Lim & Youngsoo 2010; Koh, Herring & Hew 2010; Lokey-Vega *et al.* 2018; Tiantong & Siksen 2013).

The virtual learning environment within this transformation requires that the modelling, coaching and scaffolding of the traditional master-apprenticeship model needs to happen online. Face-to-face facilitation of knowledge and modelling by the 'master' were replaced by live virtual classes, which were recorded and made available for download and instructional videos of the 'master' performing a specific task. Class discussions, feedback and consultation sessions moved to the virtual space, with the use of discussion boards, chats and WhatsApp groups between student peers and the lecturer/s. Ali *et al.* (2015: 42) caution that although there are many advantages in using such virtual discussion spaces, these conversations need to be structured. The coaching step of the cognitive apprentice model can be applied in these discussions to provide students with guidance whilst they are busy completing the project (Ali *et al.* 2015: 48; García-Cabrero *et al.* 2018: 14). Scaffolding and sequencing were not truly affected by the shift, since these steps were already embedded in the original curriculum. The remaining three steps of the cognitive apprenticeship model had to be added in most modules that followed a traditional master-apprentice model. Articulation opportunities could be created for students online through virtual presentations of projects, discussion boards and project blogs (García-Cabrero *et al.* 2018: 15). Reflective practice

activities, which provide students with the opportunities to motivate their design decisions (Frascara 2007: 65), were embedded in most project-based assessments, but did not necessarily allow students to reflect and compare their understanding and executions to those of the masters and their peers. The solving of problems through exploration to frame and define a problem is the last step in the cognitive apprenticeship model. Exploration can be encouraged by writing broader project outcomes that encourage students to explore certain sub-outcomes that are of interest to them (Collins 2006: 51). Although exploration was encouraged in most project briefs before the COVID-19 situation, some that required observational research, site visits or community engagement had to be revised to adhere to the guidelines stipulated by the government of the country. Virtual and mixed realities may be a solution to enhance student exploration in creative and design disciplines.

The proposed pedagogical shift seems less problematic for both the 'master' and student if it is a partnership of responsibility where the student has more flexibility in time, space and pace, but also takes greater responsibility than before (Bell 2010: 41; Thompson & McDowell 2019: 116). Students had to take responsibility for their own learning with self-paced and flexible project deadlines to accommodate the restrictions of movement and social distancing within this phenomenon. Some students faced challenges to access the necessary resources (e.g. computers, software, data, tools), which had to be brought to the attention of the institution so that the necessary support could be given. Students without data are supported with a provision of data bundles, and some software companies extended free, personal in-home access to their software (Adobe 2020). However, for students with no hardware, alternative dates for assignment deadlines were provided and modules that use licenced software that is only available on campus had to stand over until campuses could reopen.

Lecturers had to encourage a partnership of responsibility by adapting their teaching approaching/method. However, the 'master' now needed the capabilities to articulate the guiding principled knowledge which informs their actions to their students in their modelling activities (Collins 2006: 49; Collins *et al.* 1987: 3; Frascara 2007: 61), which might be a challenge for some masters. The 'master' also needs to guide the learning of their students through additional steps beyond modelling, coaching and scaffolding (Collins 2006: 48; Collins *et al.* 1987: 14-20) within a virtual environment with which they also might not be comfortable. Lecturers and students received orientation

to use a virtual learning environment with extremes of novice and advanced users in both categories and many had to learn while teaching.

The unique South African digital landscape needs to be considered within the proposed pedagogical shift, since in most cases it requires a data-light approach. Data light is the principle that all content designed and developed needs to be provided in formats that use as little data as possible. This principle is important to ensure that students can continue with their learning journey with limited data and resources (e.g. a mobile phone and not a laptop). Multiple formats of learning content need to be available with asynchronous learning activities to enable students to work around their situational challenges (e.g. power, connectivity, social context) to provide an inclusive learning environment (University of Cape Town 2020: 2). Although the use of virtual and mixed reality is quite commonly used in today's classrooms to bridge some of these challenges, it is not advisable within the current situation in South Africa to opt for such high-tech solutions, since it may result in students without good internet connections and sufficient data to be excluded. Another challenge that also surfaced was that certain materials or drawing mediums for projects had to be changed, since these were not available on the specific level of lockdown at stores/online stores. In some cases where technology could not assist a pedagogical shift, the module was moved to the next semester.

Reflection-on-action and Way Forward

A crisis is not necessarily a disaster, but a turning point or high-point where business as usual cannot take place due to a failure of sorts (Dhunpath, Amin & Devroop 2018: 1-5). The South African Higher Education landscape has seen several crisis moments over the past years regarding inequalities, marginalisation and student uprisings (e.g. 2015 #RhodesMustFall and #FeesMustFall). Five years down the line we are reflecting on actions taken during a new unforeseen crisis that not only produced new challenges but also revealed pre-existing shortcomings in pedagogy and society. The COVID-19 crisis is described in this article as per Dhunpath *et al.*'s (2018: 1-5) contestation (i.e. engage and understand the crisis) and contemplation (i.e. examine, observe and reflect) phases; however, we now extend the reflection to reflection-on-action. Reflection-on-action includes reflecting on the challenges faced, lessons learned and the emerging opportunities (Schön

1987: 26). Our reflection-on-action includes resilient transformation in a crisis, solution-focused design thinking and the positive belief in the future (Brown, 2008). The future role of higher education during a crisis is important, since this space should 'inspire innovation, social experimentation, new forms of reflection and the production of knowledge, to create a better future for all those who live on the planet' (Dhunpath *et al.* 2018: 4). Therefore, the reflection-on-action also reflects on the need for a quick recovery after this crisis, upholding the integrity of the curriculum and the future employability of students graduating at the end of the academic year.

One of the emerging opportunities presented by the shift to online teaching is the break with tradition that provides the potential to shift teaching and learning towards better alignment with 21st-century requirements, as outlined in the first section of this chapter. Design education in South Africa is slowly transforming to embrace these new socio-economic and technological challenges and opportunities, with the focus shifting from 'crafting' and 'execution' to 'strategy' and 'sense-making' with people and planet-centred, democratised approaches. The need for this transformation echoes discussions at the 2017 conference of the Design Educators Forum of Southern Africa (Botes & Giloi 2017). The theme of the conference was on decolonising design education. The questions that were asked included which way design education should go – should the focus be to educate graduates only for the workplace, or with holistic skills to make a positive impact on a world? Design educators pointed out the need and 'potential for design students to learn to become ethical, empathetic, critical and moral co-designers rather than mere operators of technology driven by a profit motive' (Botes & Giloi 2017: iii-iv). The 2019 DEFSA conference further extended this debate and asked 'how design education might prepare students for an unpredictable future in which they will have to rapidly acquire new knowledge, learn new skills and adapt to new contexts and cultures' (Botes & Giloi 2019: iii-iv). Two aspects that stood out were the need for students to 'be faithful to their local culture and have greater agency over their learning' (Botes & Giloi 2019: iii). Both these recent DEFSA conferences expressed and explored the need for change in design education and echoed the discourse on the changing nature of the discipline, together with a changing education landscape (Voûte *et al.* 2020: 54).

Our reflection needs to be seen against the background of the continuing discourse for change in Higher Education in South Africa, from both general and discipline specific perspectives. However, nothing could

prepare us for a crisis of the COVID-19 nature, its unpredictability and scope, and the speed needed for adjusting courses and delivery. The 'contestation' and 'contemplation' phases merged with reflection-on-action, with little time to pause. One of the first realisations was that to bridge the unthinkable, we had to think the unthinkable and challenge the status quo of design education. Such an overdue challenge was that of the overreliance on the traditional (and comfortable) way of teaching in the master-apprentice model. By moving the studio and project-based teaching and learning online, the relationship between the lecturer as 'master' and student was shifted together with the curriculum (i.e. principled and procedural knowledge and theory) to create a new partnership between the lecturer now as facilitator and student as co-creator of knowledge. This change in the power dynamics of teaching and learning in design education is supported by the underlying learning theory of the cognitive apprenticeship model.

The question needs to be asked why the traditional master-apprentice model could not simply be shifted to the online virtual space. One could easily fall back on the comfort of the master-apprentice model and try to emulate this, but the nature of the virtual classrooms and the new awareness of what students do in the studio time force a rethink of delivery, actions and value. The choices that our academic teams and leadership collectively make may take the direction of either being reactive to the crisis or proactive in driving change. Some factors are unpredictable and outside our influence. What we could change was the nature of the project briefs and with a shift in emphasis on crafting to concept, process and reflection and broader skills. Rubrics were also adjusted to reflect this change, resulting in a renewed scrutiny of the way creative and design work is assessed. Hard choices regarding workload had to be made and some project briefs had to be dropped, challenging the traditional notion of what ought to be in and the size of an exit-level portfolio. Rather, the focus shifted to fewer, better developed projects and the broader skillset and insights required in industry and future careers of our students. Designers in the local industry have already shifted to the virtual space for continued education as an ongoing activity, with online courses perceived positively and trusted to deliver contents and courses, when needed, in flexible modes (Van Zyl 2018: 81). One of the positive outcomes of a shift to a virtual space is that students rely less on the master for directions, and ought to be better prepared for future continued education as a result of taking greater responsibility for their learning, actions and tasks.

At this point we cannot evaluate the consequences of these choices, but so far both students and lecturers have demonstrated a willingness to shift modes and have shown resourcefulness during the first two weeks of online delivery (the time when this chapter was written). The online virtual space already provided new opportunities for internal and external collaboration. Furthermore, anecdotal feedback and comments recorded during online sessions indicate that lecturers and students share mutual empathy and care. However, such an unplanned shift from traditional face-to-face studio space to a virtual space is not without challenges. One of these can be that students now have more control over their learning and that this may result in students learning to master only what they want to without scaffolding their skills (Ghassan *et al.* 2014: 252). This can be overcome with a well-designed, structured syllabus suitable for blended spaces; however, within the time and capacity limits, some limitations and shortcomings will most certainly be revealed as the unusual year proceeds and will require ongoing agility to ensure students are not left behind and all learning outcomes are met. Structures are put in place to collect regular feedback from students and lecturers to identify unintended shortcomings and these will need to be addressed as they are identified and understood.

Some design briefs require access to people (such as for observational research and community engagement). Some of these important activities can be shifted online but could be challenging, or not safe. After consultations with lecturers, some of these briefs were replaced with briefs that specifically challenge designers to envisage solutions for the COVID-19 crisis (such as the Loeries – #CreateChange Campaign). This way students and lecturers can connect with broader local and global societies during the crisis, and thus learn the value of contribution as a designer.

The other challenge that has already revealed itself is that of access to resources (computers, data, software, tools, equipment, mediums). Despite being a private provider, many of our students used the resources on campus. Moreover, whilst students may keep up with theoretical learning, some of the practical applications will fall behind. A flexible and empathic approach is needed in such an unpredictable situation. An education system cannot evolve without keeping the mental and physical wellness of the students and lecturers in mind, especially when the traditions and conventions are challenged. It is here where a robust model such as the cognitive apprentice model provides guidelines and insights to make informed choices and reduce risk.

It also becomes clear that not all projects and modules can be taught online. Some specialised software modules or skills will have to stand over for face-to-face instruction. If such blended learning needs to continue, then it becomes clear that the mobilisation of data and suitable hardware is a must-have, rather than a nice-to-have and that our capacity must increase in future to deal with the modules that are now seen as impossible to teach online.

Limitations of the Research and Opportunities for Future Research

Reflection in and on action becomes challenging when the environment is in constant flux and characterised by uncertainty, especially within a crisis moment such as COVID-19. This study exhibits limitations of a contextually embedded case study without external validity at this point, due to the specific crisis's unpredictability, scope, and the speed needed to transform the mode of delivery to avoid an educational standstill. The limitations of the researchers' reflection also need to be read within the dimension of the human capability of handling such a complex crisis as COVID-19. This chapter rather provides a starting point for further research on the resilient transformation of studio-based teaching and learning in creative and design disciplines towards a cognitive apprenticeship model to promote innovation, experimentation and improved futures for all (Dhunpath *et al.* 2018: 4; Dorst 2019: 118; Norman 2016: 343). The shift to a virtual classroom also leaves a digital audit trail for academic teams and researchers for possible research opportunities, which would not be available within a normal face-to-face class.

Concluding Remarks

The day after President Cyril Ramaphosa had declared a national state of disaster, he said that '[t]he Thuma Mina moment is upon us, perhaps as never before' (Ramaphosa 2020). Upon reflecting on the events over the past few weeks, it is clear to see how this slogan guided most stakeholders' decisions to overcome challenges through empathy, support and kindness at the root of every decision. The local and global impact of COVID-19 will most likely be written up in history as a global pandemic, but for some, it provided a 'shifting moment' (Madonsela 2020).

This chapter reflected upon the pedagogical shift needed in studio-

based teaching and learning in creative and design disciplines in South Africa to avoid an education standstill; however, this is only one part of the story that unfolded during the reflection on the COVID-19 crisis at this point. The other part is the realisation that design educators and researchers need to take a hard look at design education and challenge the status quo of the way design is being taught in South Africa. Knowledge needs to be deconstructed to expose the values, assumptions and beliefs of the master-apprentice model that hinders the transformation needed of the curriculum of studio-based modules. Design education needs continuous change to keep up with the ever-changing and challenging world (Noël 2020: 6), since these disciplines are constantly changing and shifting their focus. Dorst (2015: 130) calls this a 'formidable challenge' for staff and students and points out the need to be active on many fronts to bring about transformation in a complex organisation such as an educational institution. This transformation may require the deployment of some initiatives such as the retraining of lecturers, appointment of new staff members with different skillsets, the stimulation of debate through talks, exhibitions, research labs and multidisciplinary design approaches (Dorst 2015: 130). These need to be visible changes rather to show, than trying to convince through talk and argument.

Design educators in South Africa need to ask themselves whether this is our shifting moment to speed up the necessary transformation of studio-based modules. However, this is no small task and in the words of his excellency, President Cyril Ramaphosa would require a 'Thuma Mina moment' for all design educators in the country to pull together to make this transformation.

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