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Tertiary Online Teaching and Learning

TOTAL Perspectives and Resources for Digital Education

Springer

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To the next online generation and to our next generation, our children—Miranda, Fotios, Andriane and Julian

Preface

Opportunities and Challenges for a Brave New Education World

Abstract This book was inspired by an international symposium on online education that was hosted by Monash University and King's College in Melbourne in February 2018. The book was conceived and created after the symposium to help the rapidly increasing numbers of people who are already in and who are arriving in our brave new online education world—students, educators, developers, and administrators—realize and expand the advantages of online education, and understand and reduce its disadvantages. Online education is no longer new; however, it is new to international education's center stage. The widespread recognition of the full value of online education has recently been accelerated by the new education opportunities required by the COVID-19 crisis—great problems require great solutions. The real value of our current new online world and its emerging next generation includes increasingly valuable education flexibility and access, which provides immunity to the increasingly devastating problems in our physical world which are reducing access to traditional education. An online student orientation site that two of the editors (FG and SM) led the development of is, for example, being provided as valuable support to international students who have lost access to traditional education and education support due to COVID-19 pandemic-related university closures and replacement of on-campus course delivery with online course delivery. This preface sets the scene for an online education perspective and resource book that will help current and future members of the rapidly growing online education community realistically recognize and benefit from the rapidly evolving potential of this exciting new education opportunity.

Oh, wonder!
How many goodly creatures are there here!
How beauteous mankind is! O brave new world,
That has such people in't!

William Shakespeare,
The Tempest, Act V, Scene 1 - Miranda

The demand for increasingly flexible and vocationally relevant learning, the growth of life-long learning, a limit on physical campus space, and emerging traditional educational barriers including the COVID-19 crisis has resulted in institutions rethinking their education delivery. The pedagogical practices of universities are rapidly evolving to include and feature online and mixed online/on-campus (hybrid or blended) methods to provide more flexible learning and teaching. Online education has been defined as "teaching and planned learning in which teaching normally occurs in a different place from learning, requiring communication through technologies as well as special institutional organization" (Moore & Kearsley, 2012, p2). Advantages of online courses and course components include flexibility and convenience of when and where to study and teach, financial and physical economies, and even pedagogical advantages. Disadvantages, or challenges, of online courses include real or perceived lack of equivalence with on-campus courses and academic engagement, along with significant challenges in ensuring students are supported and do not feel isolated.

Whether or not we like it and whether or not we understand it, yet, we need to decide and learn how to best use online education in our brave new education world. The growing popularity of online education reflects a paradigm shift in current practice, from face-to-face to technology-mediated approaches to learning, rather than the adoption of something new and completely unknown. Historically, new communication mediums have made possible the advancement of associated education technologies, and the invention of the printing press circa 1450 made learning via distance, or off-campus, possible. Our brave new distance education world began as early as the nineteenth century, when actual distance education courses were offered, including the University of Chicago which offered an off-campus program in the 1800s (Mclsaac & Gunawardena, 1996).

The rise of the radio communication medium extended distance/off-campus learning possibilities via creative teaching and learning solutions such as the School of the Air, which began using two-way radio broadcasts to educate children in the Australian outback in 1951. The rise of the television communication medium further increased distance/off-campus learning scope and support including via the commencement of the Open University in the United Kingdom in 1971, which used special education TV programs to supplement its courses. The Open University's core off-campus teaching materials consisted of a study guide handbook and a book of associated readings—an early form of the online e-workbooks and associated multimedia resources via Learning Management Systems. Furthermore, the rise of personal computers and emails led to a further expansion of distance/ off-campus teaching and learning. The first fully online course was offered in 1981, and the first fully online program containing a group of online courses was offered in the Western Behavior Sciences Institute in California in 1982 (Harasim, 2000). As such, the online education we know today can best be seen as an education evolution, rather than a revolution.

Online education has recently reached a critical education energy-momentum that is being felt at every level of education. Its rapid expansion is meeting the rapidly growing educational needs of the rapidly growing numbers of students that want and need it, including students who need flexible and far-reaching education due to work and family commitments, due to geographic or other isolation, and due

to the substantial traditional education barriers imposed by global events including the COVID-19 crisis. This book is intended to help online education continue to grow and evolve responsibly and optimally. Responsive and optimal development rather than merely opportunistic growth needs to be driven by real user needs and evolves in a way that best serves its users and the communities that these users learn, live, and work in. Optimal online growth also requires conscious and conscientious leading of the way forward and also remembering of foundational theory and research into best-practice education. Viewing online education as an evolution of the face-to-face education mode will create connections between past, present, and future education, and continue the progression toward total education that is successful, fulfilling, and enjoyable.

Total online education success needs to include equivalence to on-campus education not only in learning content, but also in vital education intangibles, including levels of belongingness to an education community, full learning engagement, and student well-being, as well as academic equivalence. Achieving total success in our brave new education world requires us to base online course development and refinement on online education research, and to meet real twenty-first-century challenges with a fully realized twenty-first-century education medium that fully equips its students for real twenty-first-century life. Achieving real online worldliness requires us to fully utilize and integrate technological and pedogeological advances so that online education isn't just an online version of on-campus education, as early TV was often just radio with pictures.

Our online education next generation needs to optimally incorporate and integrate emerging technologies such as virtual reality and simulation and state of the learning art teaching practices and learning outcomes, including deep learning, transferable skills, and real work readiness. This book welcomes you to our brave new education world and prepares you to optimally live and learn in it—safely, enjoyably, productively, and creatively—whether you are a part-time or full-time online educator or course developer. This book will:

- Help you be an active contributor in the online education space, and fully engage in and contribute to online education's evolution into ever new and improved forms.
- Provide general online education knowledge that will support the development of specific course knowledge and specific courses.
- Provide emerging online education resources, practices, and experiences that will inform this new way of thinking, and its eventual realization in optimal online education outcomes.
- Offer perspectives from experts in the field of a brave new way of thinking about online education.

The book is divided into the following parts, which together offer one-online-education-stop valuable perspectives and resource for online course students, teachers, developers, researchers, and planners—to inform and support online education across online courses and institutions.

- **Part 1—Innovations and Advances in Online Education**
  Specific opportunities for increasing the value of the online education medium are provided. Chapters include descriptions of audio feedback, chatbots, and other online learning and teaching innovations, a fully online-integrated research system, and emerging online educational opportunities of virtual reality.
- **Part 2—Student-Centred Online Education**
  A deep and practical understanding of and techniques for improving the whole online student experience are provided. Chapters include descriptions of how online education can best equip students for their working life and how online education success needs to include student well-being and a sense of community.
- **Part 3—Online Education Examples**
  Online users' stories of their online education experiences, including stories from online students, teachers, supervisors, researchers, and developers are provided, and suggestions are offered for how future online experiences can be improved.

We have a great opportunity to recognize and optimize online education as a "beauteous" education medium, full of goodly online creatures. We can use the vast energy of this emerged and emerging brave new education world to more than equivalence with the old education world, including via the optimal use of integrated multimedia teaching and learning features, and via the optimal use of a brave new way of education thinking and rethinking.

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Part I
Innovations and Advances in Online Education

Introduction

This part of the book conveniently brings together, highlights and describes a wide range of emerged and emerging online education innovations and advances. The chapters in this part of the book will individually and together help the rapidly growing online education community—including course developers, teachers, learners and administrators—optimally understand, benefit from and contribute to this important aspect of online education, by:

- Understanding that 'Innovation' is a development process and an engagement with the development process, and not an act of technical competence.
- Understanding and working with individuals and their differing attitudes, readiness to change and motivations.
- Being sensitive to and addressing any concerns about new delivery approaches.
- Using evidence to understand, develop and refine.
- Being flexible and willing to change.
- Recognising the vital importance of the online student experience.

This part of the book is divided into:

Chapters 1–5 provide practical perspectives underlying online education innovations and advances—a context to aid recognition, understanding and use of online education innovations and advances. The chapters in this section of this part of the book feature the use of evidence and analytics to design and improve courses (Chap. 1), using personalised education features to improve the online student experience (Chap. 2), using chatbots to develop learning communities (Chap. 3), using virtual reality to improve the online student learning experience (Chap. 4) and a bringing together of learning design and service design (Chap. 5), and Chaps. 6–9 provide resources related

to practical online education innovations and advances in online education development, teaching and learning. The chapters in this section of this part of the book feature an online education toolkit (Chap. 6), how to develop, maintain and use active learning resources (Chap. 7), how to optimally create and use virtual reality in online education (Chap. 8), and a description of a fully online research system (Chap. 9).

Chapter 1
Online Education by Design: Using Evidence and Course Analytics to Achieve Best Online Teaching and Learning Practice

Jason M. Lodge

Abstract While traditionally higher education has been conceived of and delivered in a face-to-face manner, not only have learning activities moved online but the on-campus experience is no longer the benchmark to which all university education is compared. This transition has implications, particularly for staff and institutions that are not familiar with the affordances of digitally mediated delivery of classes. Online and blended learning require skills that go well beyond traditional approaches such as the campus-based lecture. Design thinking provides a means for managing the complex task of creating online and blended learning; however, design does not provide a panacea. In this chapter, I describe the contributions of the learning sciences and learning analytics to the design of online and blended courses in higher education. Design informed by evidence and data has the potential to uncover innovative approaches for delivering high-quality higher education now that teaching in this context has been unshackled from the live on-campus experience.

1.1 Introduction

Teaching in an online environment is a complex and difficult task, particularly for those who are accustomed to teaching face-to-face, as many university educators are. Traditional notions of higher education have been built around the idea that the campus is the place where students are immersed in ideas and an intellectual culture, culminating in them graduating as professionals, scientists or scholars. Online higher education has been around for decades and, however, in recent years, has become mainstream, meaning many more people are involved in the delivery of courses using technology in various ways. This trend is evident in the rise of notions like 'blended learning' and 'the flipped classroom'. These new options for the delivery of degree programs are raising questions about the relative value of the online and on-campus experiences (Lodge, Kennedy, & Lockyer, 2021). It is becoming increasingly evident

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that quality learning and teaching online is not just a matter of replicating the central aspects of the campus experience. A sophisticated and tailored approach is required for effective online instruction built on the unique affordances of digital learning environments.

Two key developments in educational research are beginning to address the complex problem of designing and delivering high-quality courses in institutions that have been strongly committed to the face-to-face model. These developments have come about through new approaches to evidence-informed design for online learning and are the focus of this chapter. One of these trends is the (re-)emergence of the learning sciences as a foundation for quality higher education (see Lodge, 2016). The other is the establishment and rapid evolution of the field of learning analytics. The former is focussed on the translation of foundational research on learning to applied settings (see Halpern & Hakel, 2003), and the latter is the collection and analysis of various forms of data (often large datasets) for informing various aspects of higher education (see Gašević, Dawson, & Siemens, 2015).

The targeted translation of research about learning and the effective collection and analysis of large datasets promise to provide new insights that can feed into the design process. However, this process is neither linear nor straightforward. There is much to be done to implement high-quality online learning in a higher education context. The emergence of new technologies and a global higher education market are increasing the pressure on individual institutions to make this transition. In order to respond to these trends, institutions and individuals need to design learning activities and assessment tasks that better align with this new reality. It is this design process that I will discuss first before delving into the integration of the learning sciences and learning analytics into this process.

1.2 Design for Learning

Design for learning, or instructional design, provides a key mechanism for dealing with the complexities and novelty of online higher education (Goodyear, 2015). Much has been written about the value of design thinking for this purpose. However, design thinking is, itself, complicated, and there is a tendency to oversimplify the design process (Hernández-Ramírez, 2018). Design for learning requires expertise that many academic teachers do not have and have limited time or capacity to develop (Elliott & Lodge, 2017). This issue is exacerbated by a long history of domination of particular conceptualisations of learning in higher education research and practice (see Kandlbinder, 2012). There has been much emphasis on the student experience and student satisfaction and insufficient attention paid to robust evidence about which design elements lead to quality learning that sticks (Halpern & Hakel, 2003). Consequently, design decisions tend to be based on intuitive heuristics or rules of thumb rather than on rigorous evidence (Bennett, Agostinho, & Lockyer, 2015).

The problem of certain conceptualisations of learning dominating the discourse about quality learning in higher education is further reflected in the ways in which

quality is inferred through policy and practice. In Australia, for example, there is discussion of the use of a set of indicators for the purpose of allocating performance-driven funding to universities (see Commonwealth of Australia, 2019). These indicators include student satisfaction, employment rates and other outcome factors. None of these provides a good indicator of quality learning; rather, they are crude economic and market indicators. The drivers for maintaining and enhancing quality learning experiences therefore do not focus on the aspects of higher education that matter for long-term learning.

The seeming lack of an approach for applying and valuing rigorous evidence to teaching in higher education does not mean, however, that there are not sophisticated intuitive design processes occurring. On the contrary, Bennett, Agostinho, and Lockyer (2015) found that there are complex intuitive design processes guiding the development of curriculum, assessment and learning activities. While these processes are partly necessitated by the demand for higher quality learning experiences across mediums, it is perhaps in the online realm that academics, in particular, are less equipped to design and deliver online instruction. As per the widely discussed Technological Pedagogical Content Knowledge (TPCK) framework (Mishra & Koehler, 2006), teachers and teaching support staff in universities are now not only expected to develop expertise in their discipline but also in pedagogy and technology.

Many design models have been forwarded to both explain and facilitate the design process in higher education (e.g. Garrison & Kanuka, 2004; Goodyear, 2005; Laurillard, 2002). What all of these contributions assist with is in making what is a vastly complex design challenge into more manageable pieces or provide a structure to allow a systematic approach to decision-making in the creation and updating of curriculum. This structure is critical in higher education, in particular, where academics who largely do not have a background or qualifications in education are increasingly being asked to carry out sophisticated design work to deliver online and blended courses. Design provides a means of making the complex task of transitioning to these delivery mediums more manageable without everyone concerned needing to complete a qualification in education.

1.3 Evidence-Informed Design for Learning

A concerted effort to understand and translate research findings from the learning sciences for higher education is underway (Agarwal & Bain, 2019). The learning sciences encompass a broad range of disciplinary fields examining foundational learning processes and how an understanding of these processes can be used to inform education. The disciplines involved in the endeavour span neuroscience, psychology, education and computer science, among others. Early attempts at this translation were rightly criticised for being reductionist and erring towards pathologising students (Selwyn, 2016). However, recent translation efforts are now more sophisticated and nuanced, providing robust ideas about more effective design approaches for online

learning, without being prescriptive or diagnostic (e.g. Nugent et al., 2019). Post-positivist approaches such as those dominant in the learning sciences and learning analytics do not provide a panacea; there are challenges in interpreting and using the findings (Lodge & Corrin, 2017). This is where the power of combining design with the learning sciences is to be found.

The combined efforts of researchers have led to the identification of robust approaches that reliably enhance learning. For example, retrieval practice has been repeatedly shown to be a superior approach to learning new content than numerous other approaches such as revising (for review, see Roediger & Butler, 2011). A range of similar strategies have been found to have a positive impact on learning under controlled experimental conditions (Dunlosky, Rawson, Marsh, Nathan, & Willingham, 2013). Despite the inherent value in understanding these effective strategies, making sense of these outside the laboratory environment has proven a wicked challenge for researchers and practitioners. It would be tempting to take a robustly effective approach such as retrieval practice and build an entire pedagogy around it. In practice, however, an approach to teaching that only or largely includes opportunities to be tested on material in the absence of any other learning activities has limited utility.

In order to make sense of how these emerging findings might help to enhance online learning, it is critical to think systematically about ways in which the evidence can be adapted. In other words, the challenge is to move evidence-based principles into pedagogical strategies and tactics (as per Goodyear, 2005). Design, as a mode of thinking and as a process, is effective here. Not only does design help to break down complex pedagogical problems to allow them to be handled more systematically, design also provides opportunities to draw on expertise and research findings from the learning sciences in a more targeted way. For example, breaking down the design process into a series of steps, one of the first is to try to understand more about the problem in context. At this stage, the research evidence can be brought in to shed light on what might be happening for students in that situation. Similarly, the evidence can be used to help brainstorm solutions or to help develop prototype activities or learning objects. A high-level visualisation of these points for integration is presented in Fig. 1.1.

When considering how evidence might be used to help enhance online learning, it must be recognised that the teacher is still best placed to make decisions about how best to go about creating effective learning experiences for students. In the majority of cases, the overall responsibility for a unit of study still lies with the academic staff member or coordinator. Design provides a structure to help academic teachers to make decisions about elements of the curriculum. My argument here is that design also allows for a targeted conversation about the ways in which evidence might inform those decisions. As alluded to earlier, this structure is critical in the higher education context where the individuals responsible for deciding how units of study are delivered are often not qualified in education. The structure is also helpful as designers, academic staff and experts in learning are increasingly working together to figure out how best to deliver online and blended learning (Goodyear, 2015).

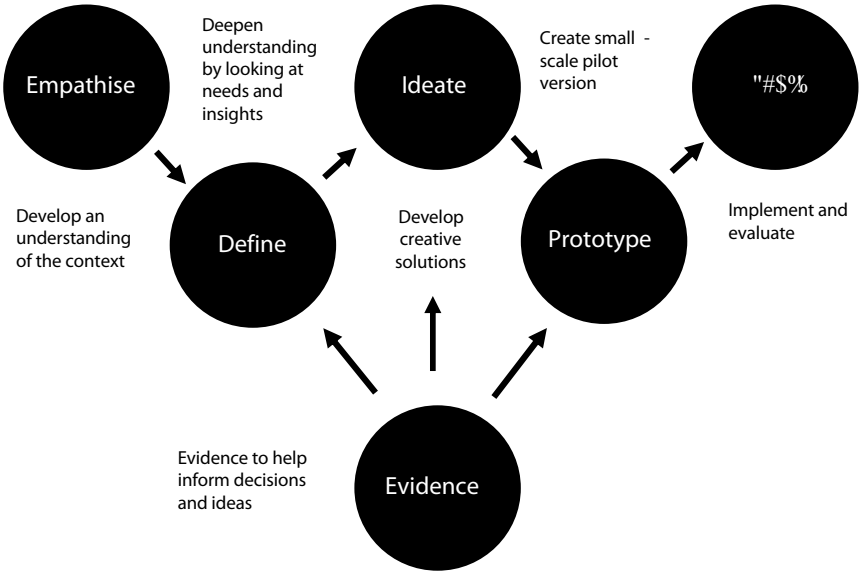

Fig. 1.1 Points where evidence may be used to inform the design process (adapted from Hasso Plattner Institute of Design, Stanford)

1.4 Integrating Evidence and Analytics into Online Instruction

Alongside developments in the integration of the learning sciences into higher education, the emergence of the field of learning analytics provides a critical mechanism for understanding and personalising learning experiences for students in online settings (FitzGerald et al., 2018). The collection and analysis of the digital traces students leave through their university experience providing another point for evidence to inform the decisions being made by teachers and professionals supporting teaching in universities.

Learning analytics provides a set of tools for helping better understand how students are learning in blended and online contexts (Lodge & Corrin, 2017). While it is relatively straightforward to be responsive to student needs in a face-to-face setting, it is much more difficult to determine how students are progressing online. In a clear example of this issue, it is apparent to most teachers when one or more students are confused or stuck in a live classroom but it is virtually impossible to read the same facial features that give this confusion away when students are learning in a digital environment (Arguel, Lockyer, Lipp, Lodge, & Kennedy, 2017). Not getting immediate feedback from student facial expressions, for example, is a substantial adjustment for university teachers. Even large lecture theatres provide opportunities for monitoring student progress in a way that is not possible online. While there are clear ethical implications for tracking student behaviour as they study (see

Corrin et al., 2019), there is great potential for using analytics to help determine how effective the curriculum is and to inform changes.

Again, the key to effective integration of analytics into higher education is through design. Lockyer, Heathcote, and Dawson (2013) argue that design plays a critical role in drawing on learning analytics to inform pedagogical action. In other words, design thinking and the design process turn data into actionable knowledge. As with the learning sciences, there are then multiple opportunities for interrogating data to help better understand any pedagogical issues and as a means of informing possible solutions. Ideally, all three, learning analytics, learning design and the learning sciences, would work in concert to help design, deliver, evaluate and enhance online and blended learning in higher education.

1.5 Future Directions

Technology will undoubtedly play an important and likely a growing role in the delivery of higher education into the future. Online and blended courses will likely become the norm rather than an aberration as they were seen in the not too distant past. The core challenges for universities are how to provide these courses without greatly increasing costs and while continuously enhancing quality. Market forces and managerialism are pushing the quality indicators towards student satisfaction and employment rates. While helping students to get jobs and making them happy are laudable goals for higher education, these goals have been prioritised well above actual quality learning. The most effective ways of learning do not always align with what makes students happy or will enhance their employment prospects. Universities and the teachers and professionals supporting teaching needs to balance the demands of the market and of governments with the approaches that reliably help students learn in ways that will stick. This balancing act is the core challenge of designing and delivering online and blended learning.

In the absence of a teaching workforce who are all fully trained and qualified in education, universities have created a cadre of professional staff to assist with the challenges of creating high-quality online and blended learning. Despite this, there remain numerous technical, policy and infrastructure barriers that constrain new approaches to higher education. Within this context, maintaining quality on the basis of evidence is particularly challenging. The body of research on what constitutes quality learning is vast, as is the body of research on teaching. Using the evidence to inform the decisions made in this context necessitates tools for breaking this complexity down. Design provides such a tool and is therefore a process and a

way of thinking that should be integrated into the university environment. A little design thinking can go a long way towards helping make sense of the evidence, how to make good decisions about the curriculum and to provide a basis for discussion about various aspects of the design and delivery of higher education.

Alongside this deeper embedding of design into teaching within universities, the integration of evidence in various forms to inform this design is needed. The evidence from the learning sciences provides an antidote to poorly conceived policy such as the reliance on satisfaction measures as an indicator of quality teaching. In parallel with the deeper integration of evidence from the learning sciences, data and analytics can further deepen the use of evidence and data to continue to enhance online and blended learning.

1.6 Reflections and Recommendations

Design is critical for informing the ongoing evolution of higher education. It is therefore useful for university teachers to consider developing some expertise in this area. Additionally, there is value in also finding ways to draw on the learning sciences and learning analytics to provide a sound basis for pedagogical decision-making. However, this level of expertise is difficult for one individual to obtain, particularly in the case of academics who often have enough trouble keeping up with developments in their own field.

In the likely event that individual teachers do not have the capacity to develop expertise in learning analytics, design and the learning sciences, it is worth exploring the opportunities for partnering with others who do have this expertise. The power of bringing these fields together to inform online and blended pedagogy is only beginning to be realised. In the current climate of managerialism in higher education, it can take courage to look beyond crude economic indicators. However, looking further into student learning than simply relying on their self-reported judgements and employment outcomes is critical if online delivery of programs is to continue to provide high-quality learning experiences for students.

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Chapter 2
Am I Just Another Number? Using Online Education Innovations to Personalise and Improve the Student Experience in Online Learning

Jaclyn Broadbent

Abstract With the massification of higher education, it is easy for students to feel like a number, especially in a large enrolment subject with much of the learning occurring online. Large enrolments can present real challenges in design, management and standardisation of assessment practices. These challenges are intensified by reduced or absent face-to-face class time for online learners, heavy reliance upon sessional staff, issues of equity and consistency across multiple campuses (including online versus face-to-face) and multiple markers, establishing and maintaining student engagement, and finding ways to provide high-quality, individual feedback. These challenges often mean that established, best-practice pedagogy, which is usually designed, tested and evaluated in much smaller face-to-face contexts, requires modification to meet the needs of large online class teaching.

2.1 Introduction

Personalisation can be particularly challenging to achieve, especially in large class teaching where a one-size-fits-all approach is easier to use at scale. Personalisation is about putting the student at the centre of educational design and includes designing courses so that they connect with students, meet their individual needs, track their progress and provide support. One way to do this is through the use of technology, which can provide a range of opportunities to personalise learning for students in an efficient way that can be achieved at scale. This chapter provides a case study of personalising the online experience for students in a large, first-year undergraduate subject (module of study equivalent to 1/8 of an academic year). The subject has an annual intake of 2100+ students (1500+ in its largest semester each year). The subject is taught and marked by 25–30 sessional staff and delivered partly online (blended mode) across four campuses, as well as in an online-only mode. Students enrol from over 30 different degree programs. This diversity means that

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students' academic preparedness, discipline experience and learning needs differ widely. Therefore, engaging all students is a significant challenge.

In this chapter, we explore three ways to personalise learning at scale. We leverage data analytics and student behaviours by using intelligent agents to target student progress in real time and connect with them one-on-one to provide support. We use technology to provide synchronous personalised support to connect with students in real time through a live chat tool. We build relationships with students by personalisation feedback using an audio tool. This chapter will discuss these three strategies:

- Automated emails and Short Message Service (SMS) based on learning analytics to connect with students based on their grades, login activity, assessment submission and completion;
- Improving the quality of feedback and student's satisfaction with feedback by recording audio feedback and using feedforward strategies; and
- Giving just-enough, just-in-time, just-for-me support using a Live Chat widget within the subject's Learning Management System (LMS) site.

2.2 Automated Emails to Connect with Students

Limits on student enrolment numbers were removed in Australian higher education, allowing more student access to university courses (Commonwealth of Australia, 2010). A new set of challenges arose due to the widened participation of previously under-represented groups and increased student numbers. These challenges included difficulties in connecting with students, tracking their progress and supporting their learning. Of particular interest to us was the human connection between the data analytics and student behaviours (for example, see Liu, Bartimote-Aufflick, Pardo, & Bridgeman, 2017). Our solution was to utilise a technology called Intelligent Agents (IAs) developed by D2L (https://www.d2l.com). IAs are automatic emails sent to students in response to a particular student action, or inaction, on the Learning Management System (LMS). The tool allows teaching staff to target behaviours and outcomes such as a grade on a test, lack of assignment submission, engagement levels on discussion boards or any other interactions on the LMS. Once a student meets set criteria, such as not submitting an assignment, then the IA automatically provides a pre-written semi-personalised message to students. This message is personalised to the students' behaviours or outcomes and can include their name within the message. The automated email can link students to resources to guide their studies or to overcome challenges they may be facing. Every learner who meets specified criteria can be efficiently reached, and therefore connected to teaching staff. Further, IA can also be set up for weeks or months in advance. Some examples of the types of Intelligent agents we have used are given directly below.

Infrequent engagement with learning resources on the LMS and failure to submit an assessment are known predictors of student attrition (Gasevic, Mirriahi, Long, & Dawson, 2014). In response to this, we used intelligent agents to send automated

emails to students who have not logged on to the LMS in the previous 12 days. Also, within 12 h after the due date for an assignment, we send automated emails to students who have failed to submit the assessment. These emails provide information regarding circumstances in which they might be eligible for an extension, emphasise that there is still time to send the piece of work late, explain the resources that are available to them and encourage them to submit. Many students reply to these emails, often explaining the extenuating circumstances that make them eligible for an extension, and often comment that—prior to receiving the message—they felt too scared to ask for one or did not think they deserved one. Reaching out first to them has meant that the teaching team was able to help many students that may not have submitted at all.

Recognising our own delight at receiving a pat on the back, the teaching team sends emails to inspire high achieving students to continue to work hard after they have received a high mark. We also try to motivate low achieving students by referring them to subject resources and university support to help them on the next assessment piece. Lastly, we send automated emails to students who improve over time—for example, improving from a pass to credit in a subsequent assessment piece. The students who often get these emails are the ones whose best effort may fall short of a high distinction.

To evaluate the impact of this approach, we surveyed students and thematically analysed 144 students' perceptions of receiving these emails. Findings indicated that the emails helped students feel motivated and persist with their best efforts when they received low marks ($n = 44$), felt connected to the subject team ($n = 21$) and felt recognised for their achievement and effort ($n = 37$). The following is an example quote that illustrates the generally positive attitudes towards IA: '*Sometimes you feel disconnected from university; receiving emails congratulating me for getting an HD made me feel that someone acknowledged my achievements & cared, made me feel included and special'*. Below is an example of the process of using intelligent agents and the timeline we follow (see Figs. 2.1 and 2.2).

Reflections/Recommendations*: Intelligent agents, for us, have been an efficient way to personalise the learning experience for students and to reach those most at risk of disengaging. However, one must be careful not to overuse them, or to make them too generic; otherwise, they lose the personalised touch.*

2.3 Audio Feedback with Feedforward Feedback

A dominant theme in student satisfaction surveys in higher education is the demand for more actionable, timely feedback (James, Krause, & Jennings, 2010). Well-crafted, actionable and personalised student feedback is recognised as an essential

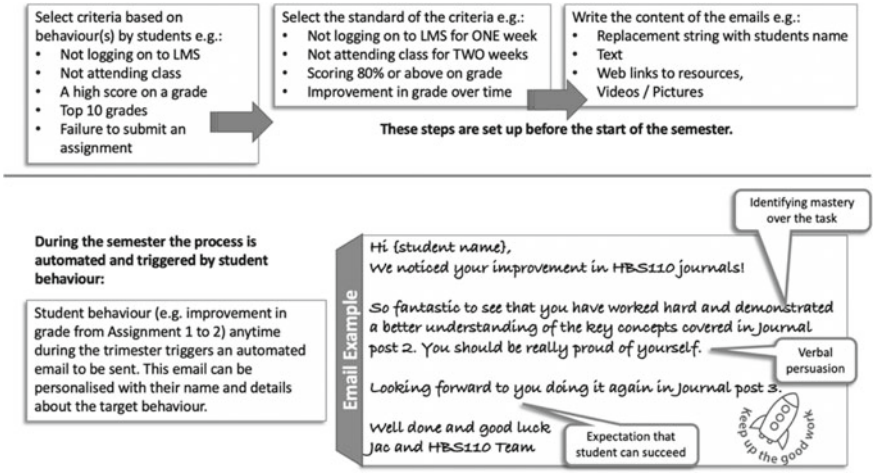

Fig. 2.1 How intelligent agents are set up and work

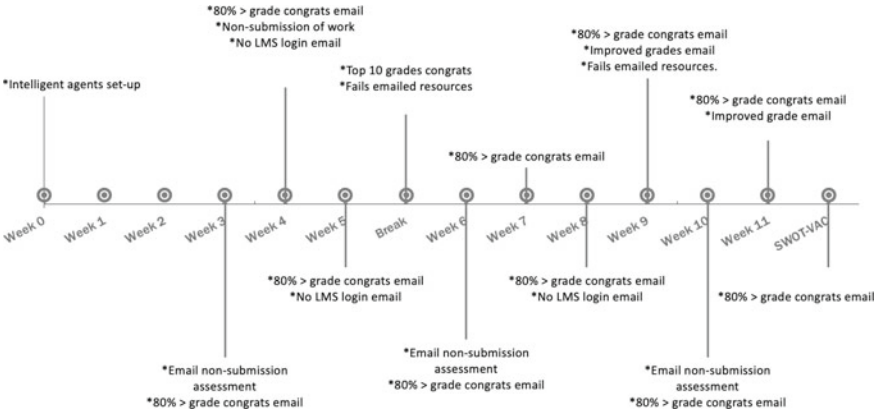

Fig. 2.2 Example timeline of intelligent agent use

component of the learning process and, ultimately, student performance (Dawson et al., 2018). Despite this, many students report receiving insufficient, or poor-quality, feedback (Carroll, 2014).

It is common in higher education, particularly in subjects with large student numbers, that feedback is provided to students in written format (Chang et al., 2012; Ryan, Henderson, & Phillips, 2019). Two key problems with this approach are as follows: (1) it is time-consuming to give high-quality, detailed written feedback; and (2) markers seek efficiencies and shortcuts, such as providing different students with the same feedback from a comment bank. Both factors can potentially undermine the impact of the learning experience and deprive students of personalised, useful

feedback that will help them improve their performance in subsequent assessments. In our Health Psychology subject, we resolved this issue by (i) replacing written comments with personalised audio feedback; (ii) restructuring the assessment so sessional markers provide 'feedforward' feedback to link it to student improvement and development in future assessment tasks; and (iii) enhancing the feedback practices of sessional staff by developing an audio moderation process. Each component is discussed below.

In order to personalise the feedback students were receiving, we implemented audio feedback. In this case example, markers provided students with a five-minute audio recording and returned it to students with sufficient time for them to incorporate the feedback in their next assessment. Audio feedback has been shown to be a highly effective means of providing feedback and is perceived by students as being detailed, personalised and usable (Ryan et al., 2019). Studies in methods of feedback to students have shown that, compared to written feedback, audio feedback can provide significantly more detail and depth, be more personal, allow for greater expression, tone and nuance, and is often preferred by students over written feedback (Carruthers et al., 2015; Lunt & Curran, 2010; Merry & Orsmond, 2008; Nemec & Dintzner, 2016). Further, audio feedback can overcome the time and location constraints that arise from engaging in face-to-face, individualised discussions (Jonsson, 2013). Since implementing audio feedback in 2011, student evaluations for the question 'the staff gave me helpful feedback' have risen dramatically in our health behaviour subject, surpassing both Faculty and University averages. The most dramatic increase was between 2010 (pre-audio) and 2011 (post-audio; see Table 2.1), and satisfaction levels have remained stable or increased in subsequent years.

In 2014, concerned that the feedback we were giving did not really help our students in their next assessment piece, we decided to introduce feedforward feedback. The feedforward feedback helps clarify what good performance encompasses, facilitates self-reflection and aims to elicit a student's best possible performance in subsequent assessment. As argued by Carless and Boud (2018), it is critical that feedback allows students to be able to act to improve future work. Thus, the audio feedback given to students in this case example is both summative and formative; it addresses both specific issues in the current assessment and details how students can improve in the subsequent assessment. The introduction of feedforward feedback saw student satisfaction increased again in 2014, as indicated by the rise in scores from 2013 to 2014. This high level of student feedback with grades has been maintained over time (see Table 2.1). For more information, see Broadbent, Panadero, and Boud (2018) and Henderson et al. (2018) case study two.

Important to the success of this process is ensuring consistent quality from markers, no matter how many markers are retained. Large student numbers are often accompanied by sizeable marking loads, which necessitate reliance on many markers, including sessional marking staff, to help assess all assignments. In Australia, for example, 80% of all undergraduate first-year marking and teaching is completed by sessional staff (Percy et al., 2008), whose expertise and experience often varies, with

Table 2.1 Student's satisfaction with the feedback they received

	% Agree
Pre-audio feedback but with exemplar	
BENCHMARK: Deakin, Sem 2, 2010 (n=31598)	72%
HBS110, Sem 2, 2010 (n responses=360)	79%
Audio feedback given	
Sem 1, 2011 (n responses =70)	87%
Sem 2, 2011 (n responses =426)	88%
Sem 1, 2012 (n responses =81)	90%
Sem 2, 2012 (n responses =485)	87%
Sem 1, 2013 (n responses =73)	89%
Sem 2, 2013 (n responses =540)	88%
Feed-forward feedback given	
Sem 1, 2014 (n responses =89)	94%
Sem 2, 2014 (n responses =534)	94%
Sem 1, 2015 (n responses =130)	99%
Sem 2, 2015 (n responses =533)	96%
Sem 1, 2016 (n responses =87)	95%
Sem 2, 2016 (n responses =318)	94%
BENCHMARK: Deakin, Sem 2, 2016 (n responses =29218)	81%

some staff having limited prior marking experience. As such, ensuring consistency of marks and feedback are major challenges for the Subject Chair.

Common moderation practices include applying assessment criteria, assigning marks/grades, social moderation (discussing and negotiating assigned grades) and double-marking student work (Bloxham, Hughes, & Adie, 2015; Klenowski and Wyatt-Smith, 2010). However, in our moderation process, we developed the marker's skills through formative audio feedback, in the same way that students receive their feedback. The personalised audio feedback sent to each marker offers examples of how to enhance their feedback and provides an opportunity to discuss their understanding and to re-mark the student's work. This innovation is impactful, as the use of technology allows us to efficiently provide detailed, meaningful, personalised and formative feedback to each marker. Developing marker skills early through formative feedback cultivates their self-sufficiency, accuracy and expertise in the grading process. An additional benefit is that it enhances marker skills over the long term, with less time needed for development in later assignments, and in future semesters (Broadbent, 2017). This is particularly important in an Australian higher education context where the majority of teaching academics are casually employed, with less opportunity for professional development (Crimmins et al., 2016). See Broadbent (2017) for more information.

Reflections/Recommendations: *Feedback is more than just the tool you use to give to students. Careful consideration needs to be given to the message, and professional development and training are required to ensure quality consistently across a group of markers.*

2.4 Live Chat

The two most common methods of communication with students online are through the use of online discussion boards with the Learning Management System (LMS) and via email. On the discussion boards, students post questions under discussion topics that are open to a response from teachers or students but are typically responded to by teachers. Communication is synchronistic, occurring over a couple of days, and is public to all students enrolled in the subject. The email contact with students is similar except private in nature and is typically, but not always, one-on-one between the teacher and student.

The asynchronous nature of the discussion boards and email can make them time-consuming for both staff and students. Conversations with students can occur over long periods and require full responses (e.g. professional salutations) from both parties in each interaction. It can also be frustrating for students to have such a stilted and disjointed conversation, where they must wait for a response to a question

they would likely prefer responded to immediately. Equally, for teaching staff, when a conversation goes over days with the same student, at the same time as having multiple of discussions with other students, teaching staff must refresh their memory of the previous conversation each time they respond. Further, the lack of conversation in real time possibly affects the teacher presence and relationship building between parties.

In order to find a way to talk online with students in real time, we adopted a LiveChat widget into our undergraduate psychology subjects. Most people have likely used LiveChat on large shopping websites. LiveChat is a real-time, interactive and synchronous communication tool. In our case, it pops up on the subject home page of the learning management system whenever a staff member is available to speak live with a student online.

The LiveChat software we use was developed by LiveChatInc (https://www.livechatinc.com). LiveChat is service-based helpdesk software that allows online chat between the service provider and client (in this case teacher and student, respectively). LiveChat is different from instant messenger services which provide a communication service between friends. The LiveChat platform allows staff to talk one-on-one with multiple students at a time. The chat is private between teacher and student; the chat with one student is not visible to any other student. The platform allows both students and staff to share files, save transcripts and chat in real time. See Fig. 2.3, for example, of the pop-up widget.

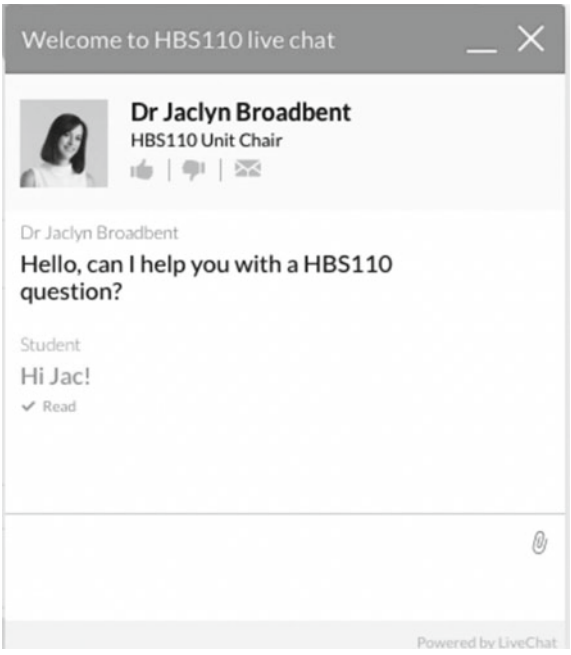

Fig. 2.3 Example of the LiveChat pop-up widget

We implemented LiveChat in a range of first-, second- and third-year subjects. Students were alerted to the use of LiveChat through announcements on the subject homepage. Each subject used LiveChat in different ways. However, LiveChat was usually maintained by the Subject Chair and senior tutors in the subject, and the widget was only visible to students in a subject when the corresponding subject staff were available. Most subjects had a set drop-in time each week, beyond which the LiveChat was available for students at random time periods when a staff member was available, with more availability in the lead up to the due date of an assessment piece.

To determine what students thought about the LiveChat widget, we surveyed students who had studied in a subject that was using this technology. We received 246 qualitative and quantitative responses from undergraduate students (aged 18–60 years; $m = 25.37$ years $SD = 9.10$ years). Learners were asked how satisfied they were with LiveChat, how useful it was for just-in-time support, whether its use made them feel that the subject team cared about supporting their learning and whether they would recommend it to others on a 1–4 rating scale. Both online and blended learners were positive about their experience with LiveChat, on average strongly agreeing to all the statements. In order to determine whether online learners differed in their experience of LiveChat to blended learners, a *t*-test was conducted. The results show that online learners significantly felt more positive about all four measures than blended learners did. See Table 2.2.

Thematic analysis of the short answer responses revealed that the majority of students used LiveChat for questions related to assessment (mentioned by 74.14% of blended and 74.32% of online students) were confident asking anything (mentioned by 45.00% of blended and 50.91% of online students) and used it for an urgent and quick response (mentioned by 63.97% of blended and 75.00% of online students). Blended students found LiveChat most useful around assessment time (mentioned

Table 2.2 Online and blended learners use of LiveChat: Satisfaction, just-in-time support, care and support, and recommend to others

		N	*M*	*SD*	
Useful for just-in-time support	Blended learner	119	3.46	0.73	$t_{(189.49)} = -2.17$, $p = 0.031$, $d = 0.31$
	Online learner	77	3.66	0.55	
Felt the team cared about supporting their learning	Blended learner	121	3.48	0.77	$t_{(198.79)} = -3.63$, $p < 0.001$, $d = 0.50$
	Online learner	80	3.80	0.49	
Satisfaction as a communication tool	Blended learner	115	3.70	0.58	$t_{(179.12)} = -3.24$, $p = 0.001$, $d = 0.43$
	Online learner	73	3.90	0.30	
Recommend to other leaners	Blended learner	126	3.56	0.69	$t_{(201.19)} = -3.82$, $p < 0.001$, $d = 0.51$
	Online learner	78	3.85	0.40	

by 48.8% of blended students), whereas online students found it most useful whenever they needed a quick response, i.e. just-in-time reply (mentioned by 47.44% of online students). Both groups of students liked LiveChat because responses to questions were instant, in real time, and convenient (mentioned by 76.67% of blended and 78.21% of online students), and online students particularly liked it because it gave them access to staff and approximated face-to-face conversation (mentioned by 48.72% of online students). Interestingly, both groups said they preferred email only when they needed to discuss something private or formal (mentioned by 55.40% of blended and 66.27% of online students), and they preferred the discussion boards for collaborative learning (e.g. benefit from or to others; mentioned by 60.43% of blended and 67.90% of online students).

These positive findings lend support for the use of LiveChat as a communication tool in undergraduate degrees, particularly for online students. More information can be found in Broadbent (in preparation).

Reflections/Recommendations: *As LiveChat occurs as a real-time conversation, it can be time-consuming for staff and disruptive to other tasks. However, we found that when using it, it reduced communication traffic from other channels, such as the discussion boards or email. As a teacher, the best time to be available on LiveChat is when you are doing other administrative jobs.*

2.5 Conclusion

There are many challenges associated with large online class teaching, particularly around the personalisation of the learning experience for each learner. This chapter addresses some, but not all, of the challenges associated with large class teaching by leveraging technology within the online learning environment. As learning is increasingly moved from the classroom and placed online, there is an opportunity to use computer-mediated technology to connect with students in a personalised way. The chapter demonstrates that learning can be personalised through tools such as audio feedback, automated emails and SMS, and LiveChat. It is important to remember that these tools, while instrumental, are still only tools, and the human aspect is still the most essential part of connecting with and personalising learning for students.

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Chapter 3
Enhancing the Online Student Experience Through Creating Learning Communities—The Benefits of Chatbots in Higher Education

Sylvie Studente and Stephen Ellis

Abstract Student engagement, or more crucially, the lack of it, is currently a massive challenge in Higher Education (Ellis in Improving Student Engagement via a Chatbot, 2019), and particularly in online HE. This situation is a result of multi-faceted drivers of student behaviour, expectations, backgrounds, needs and a whole range of other factors. Low engagement leads to a number of detrimental outcomes, such as poor results, feelings of isolation and increasing dropout rates, and is a common challenge in students transitioning from school to university (Hone and El Said in Comput Edu 98:157–168, 2016). Chatbots are increasingly being utilised to address engagement in HE institutions, particularly where resources are either dwindling or used for other matters, in response to this challenge. Traditionally, conversational agents such as chatbots were designed to meet a wide range of needs, intelligent tutoring, answering questions and learning companions (Kerry et al. in Conversational agents in E-learning, pp. 169–182, 2008). More recently, there has been a rise in the adoption of chatbots across the HE landscape (Klopfenstein et al. in The rise of bots: A survey of conversational interfaces, patterns, and paradigms, pp 555–565, 2017, Govindasamy in J Edu Multimedia Hypermedia 23:163–188, 2014), including in online courses, where they can be particularly valuable. Students are already familiar with social media and messaging platforms; chatbots extend upon this by providing students with a collaborative environment within which to communicate with each other and ask questions (Singh 2018). In this chapter, we present our plans to pilot a chatbot (*Differ*) for first-year undergraduate students at an HE institution comprised of a large international student base.

3.1 Introduction

In essence, a chatbot is defined as an interactive messenger powered by artificial intelligence which enables users to interact via a chat interface (Abbasi and Hameedullah

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2014; Desaulniers 2016). Using pattern matching, chatbots can be used to provide personalised services to students (Kane 2016; Gill 2019). *Differ* is a mobile app serving as a chatbot through which students can receive responsive information regarding modules of study and support services, or use it for social purposes to meet up and connect with new people with similar interests or issues to raise. Essentially, it is a messaging app for students and lecturers in higher education.

3.2 The Benefits of Chatbots for Online Education

Traditionally, chatbots have been used in distance learning settings, an area which has seen an increase in student signup to online courses. Whilst distance education creates a wealth of opportunities for students, high dropout rates, low levels of student performance and passive participation in learning have presented challenges in online learning (Levy 2007). Chatbots have been used in online education to assist in overcoming these challenges (Heller et al. 2005; Fernoga et al. 2018).

The integration of chatbots into online learning has been associated with numerous benefits including helping students feel more relaxed and improving their motivation in online learning (Fryer and Carpenter 2006), allowing students to access materials anytime (Andriotis 2017) and improving student's attention. Research further purports that when compared with traditional learning settings, online courses can prove just as effective when students are provided with engaging learning activities (Croxton 2014). A key element of using chatbots as a solution for this is the meaningful interaction that can be developed between peers and mentors. Such interactions have been correlated with a decrease in dropout rates. This is in part due to chatbots facilitating "learning communities" within which students can interact with each other anytime, anywhere, lending the use of bots well to self-directed learning (Benson 2001; Johnson 2006).

Participation in learning—often cited as a key engagement and enjoyment factor—is also ironically more possible via a chatbot experience as the learner is in complete control and can choose to respond or not, when they want. Contrast this to the typical classroom-based experience where the tutor is in control and the student is often a passive recipient—a mode of learning that has been shown generally to be a relatively poor method for many situations. We plan to pilot a chatbot (Differ) to first-year undergraduate students studying at a HE institution with a large international student base in traditional learning settings. However, it is important to note that similar challenges are faced in both distance and traditional learning settings. Similarly, chatbot technology offers promising benefits for distance education and traditional learning settings alike.

A recent question gaining widespread interest is "How can chatbots benefit Higher Education?" Research suggests that the use of chatbots in education can lead to a number of benefits including promoting communication between students (Johnson et al. 2000; Kowalski et al. 2011), developing learning communities (Alencar and Netto 2011), improving student engagement, improving student retention (Benotti

et al. 2014), encouraging collaborative learning (Lu et al. 2006; Bii 2013), increasing student satisfaction, increasing student confidence and motivation (Jia and Chen 2009; Bii et al. 2013), answering student's queries (Feng et al. 2006; Bayan 2005), functioning as teaching assistants (Pereira 2016), decreasing demands for low-value repetitive work on lecturers and increasing student's sense of ease (Gulz 2004).

3.3 An Easy Fix: Reducing Feelings of Isolation

A challenge in HE across both online and traditional models of learning is that of dropout rates in the first year of study. Research suggests that there is a link between the provision of individual student support and dropout rates in higher education, particularly if students feel isolated in the transition from school to university (Hone and El Said 2016). Chatbots are becoming increasingly popular in HE institutions in solving the challenge of providing individual student support (Winkler and Söllner 2018; Kerly et al. 2006). This is particularly important in the context of first-year students who may initially feel isolated. In the case of international students, these feelings of isolation may be amplified due to dealing with high levels of cultural adjustment (Okorocha 1996; Erichsen and Bolliger 2011).

A study on cross-cultural adjustment by McClure (2007) identified feelings of social isolation as a challenge for international students. Social isolation is defined as feelings of "*loneliness and marginalisation*". Research further purports that students may experience feelings of isolation if they feel they have little opportunity to engage in learning communities and receive peer support (Cross 1998). Crawford and Cook (2008) assert that learning success is in part determined by developing connections with peers and educators as part of a community. Chatbots have the potential to offer a solution towards not only establishing "communities" but also to support learning in collaborative settings (Kumar and Rose 2011). Such an approach offers an innovative way to improve the student learning experience (Chaudhuri et al. 2008) by "tapping-in" to the popularity of the use of mobile phone devices (Arnold 2018). Extending upon these points, at Regent's University London, we plan to pilot a chatbot (Differ) with our first-year undergraduate students in September of 2019.

3.4 About Differ

Differ is the result of a 4-year-long Norwegian R&D project including BI Norwegian Business School and an education technology start-up called Edtech Foundry. Based in Oslo, the team will participate as active partners in the pilot. To date, Differ has produced excellent results in improving student engagement in distance learning programmes, and we seek to extend upon this by piloting Differ with our first-year student base. Differ is a messaging app for students and educators in HE which uses chatbots to facilitate conversations replacing social media applications, such as

Facebook groups, WhatsApp, email, etc., into one integrated environment. In Differ, chatbots are used to match students to each other to initiate conversations and pair students with peer mentors (Differ 2019).

We plan to pilot Differ to assist our students to create group conversations, enabling them to join student groups and reduce feelings of isolation often felt in the transition from school to university. Via Differ, students can participate in conversations via direct chats, small groups and large communities. Students can use the app to compose questions "from the cohort" rather than individually which should give the students a better and more confident voice in their relationships with the university and their tutors.

3.5 The Planned Pilot

Our institution is a small (around 3,500 students), private not for profit, London university with a 90% international student client base. As such, a sizeable number of our students can feel disorientated when starting their academic journey. Many of our students come from relatively privileged backgrounds, and when they join us, it can be quite a shock to need to organise themselves and get quickly into the routine of study. The Differ bot will help such students settle in, make friends quickly and get them ready to commit to their new role and new experiences. The bot can be used to remind and assist students of their commitments, their schedule, their assessment regime, etc. In time, we hope it will become a virtual "PA for learning" and a key step in developing our longer term ambition of an interactive and engaged learning community.

We plan to pilot Differ with our new student intake in August and launch fully in September. Our aim with the pilot is to provide students with a way to engage with the "art and practice" of learning. This means being part of, and contributing to, an active learning community, not a merely transactional relationship which seems to be the current condition. For learning communities to thrive, we need to focus our attention on the initial student peer relationships, as they are important for strong social and academic integration. The pilot we are trialling will emphasise relationships to drive engagement.

The idea of the app is to help solve issues around student loneliness, by enabling new students to connect with their peers as they mentally prepare for orientation week. Differ chatbots are used not only for answering questions (as is the traditional chatbot user experience), but for connecting students with each other in a direct chat, thus providing a "digital icebreaker" that lowers significant barriers to connect. As the app is adopted by students, it can be used to push messages via chat or allow students to become more engaged by chatting with their peers to create a crossover from social to academic issues. By improving student relationships, we expect Differ to help more students find a "study buddy" or friend and improve their confidence to contribute to the peer learning community. Peer pressure can also act in a positive

way to protect and support those who might be wavering, in addition to the formal support services.

The trend towards modularisation of degree programmes has often inadvertently led to increasing feelings of isolation as "tutor groups" or "programme groups" have largely disappeared in the mist of the "pick and mix" nature of many programmes. When we have asked some final-year students who else they know on their (3 or 4 year) programme, it is often a frighteningly low number. Given that networking is a major benefit of going to university, this seems to be a real failure of current practices that the Differ app will be able to positively address. We will monitor the pilot after the first 10 weeks of the programme to assess the impact. We plan to use focus groups of students to get their input and ideas on how the bot is operating.

3.6 Reflections and Recommendations

Based on our plans to pilot Differ, and the wealth of research undertaken in the area of chatbots, we suggest a number of recommendations. Research has highlighted that the use of chatbots in HE has great potential in impacting the ways in which students search for information and interact with each other (i.e. Winkler and Söllner 2018; Sjöström et al. 2019). Moving forward, we recommend the use of such technology for large student communities at universities, particularly with regard to responding to student support queries. Regarding the facilitation of student communities to remove feelings of isolation, we expect the use of chatbots in HE to offer a positive impact on the overall student experience, particularly in terms of student motivation and satisfaction.

Looking towards the future, an area of possible extension could see chatbots utilised not only to facilitate learning communities, but also to provide assessment guidance and formative feedback to students regarding their performance. To date, chatbot platforms used in HE are text-based; however, future applications might include speech input to further enhance the experience for students. This is an avenue currently under investigation (i.e. Novielli et al. 2010; Abdul-Kader and Woods 2015).

The ultimate goal at the moment (for education technology in a fast-paced world) is to create an effective "Learning bot". With more and more apps available and being developed to support many and varied aspects of life, it seems unrealistic to believe that the highly personal act of learning and developing should not have the same level of support. A "virtual PA" for personalised development and learning will we believe be a rich seam to mine. The learning bot can remind students what they need to study, when and how, recommend sources, provide feedback, and a whole host of other tasks we have not yet configured, but it is on the horizon.

3.7 Recommendations Specific to Online Education

Although research purports an increase in students signing up to online courses, we have highlighted a number of challenges faced in the area of online education, such as high dropout rates and passive learning participation (Levy 2007). These challenges are reported to be correlated with feelings of isolation. The recommendations we have made here not only apply to more "traditional" settings, but also to the area of online education.

Regarding online education, more crucially, it is recommended that chatbots be implemented to encourage the development of meaningful interactions between peers and mentors to reduce these feelings of isolation. Additionally, we recommend that chatbots are utilised in ways which support online learning in collaborative settings. The nature of online education also emphasises a need for individualised student support, particularly for students demonstrating low levels of motivation and participation. Together, these facilities offered through chatbot technology may assist with decreasing not only feelings of isolation, but also the associated high dropout rates reported in the area of online education. In either case, whether traditional "classroom"-based learning or for purely "online education", the establishment of learning communities appears to be a key benefit of chatbot technology.

The use of technology to support student communities and engagement is really now a matter of bringing the online education environment into line with other online experiences that students are familiar with and use on a daily basis. If one imagines the education being used as a service, the provider needs to be able to employ all the devices available to connect with students, on their terms, and the use of chatbots to enhance this interaction would seem to have many advantages not least of which include reduced cost, improved consistency and speed.

3.8 Conclusions

What we are aiming for with our pilot is a quick, high impact intervention that sets the foundations for further work in the field. Our motivations come from a huge level of dissatisfaction with the current levels of general engagement we are experiencing as delivering academics. Academics will always complain that their students are not engaged or committed enough, but we have to hold up the mirror and ask ourselves fundamentally what it is that we want them to engage with. Coming to university for the pursuit of knowledge is no longer the model in most student's minds, we believe. University is a learning experience which includes a whole host of things above and beyond knowledge acquisition. Whilst at university, students can make lifelong connections with people from cultures, they might never know existed, develop a graduate skillset and pursue their thinking and critical awareness of issues they had never even contemplated previously. But these rewards only stem from engagement and the institution doing the utmost to make these vast opportunities available. If a

chatbot technology solution provides the basis for a step forward, we look forward to it and the improvements we can achieve.

Our pilot is a way of testing the water and trying a solution that looks to have strong face validity. If it works, it can change the HE landscape and move towards a more positive vision of the digitisation of learning. This change will require major adjustments to the roles of tutors, learning technologists and others in the current mix of HE provision. What we are convinced about is that we cannot carry on much longer with the status quo of low student engagement levels, high dropout rates and failure to fully achieve as a commonplace. When something is badly broken, we must find a solution to ensure sustainability and we believe this will be a significant part of it.

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Chapter 4
Enhancing the Online Education Experience Using Virtual Reality

Irwyn Shepherd

Abstract The strategic use of immersive interactive learning technology as a teaching, learning and assessment method is rapidly expanding across a wide range of industries (Shepherd in A Conceptual Framework for Simulation in Healthcare Education, 2017). From a healthcare education perspective, simulation, with its wide range of applications, including Virtual Reality (VR) is increasingly penetrating and influencing the preparation, professional development and continuing education requirements of most disciplines of the healthcare workforce (Blum et al. in Int J Nursing Edu Scholarship 7(1), 2010; Bogossian et al. in Nurse Edu Today 34:691–696, 2014). Indeed with Psychological Sciences, the use of VR as a simulation-based activity is beginning to gain traction as a platform for the experiential learning about and addressing issues that challenge existing learning strategies and processes (Adery et al.in Psychiatry Res, 2018; Valmaggia in The use of virtual reality in psychosis research and treatment, 2017). As more and more units of study are being delivered through a digital (online) learning platform the need to ensure that evidence-based, pedagogically driven levels of authentic learning are being delivered becomes an important consideration. This includes the potential of VR to augment the online course content using computer-generated simulations of realistic immersive, interactive three-dimensional (3D) images, ideas or environments, using specific electronic equipment. By developing pivotal, strategic VR-based learning activities, difficult theoretical concepts or uncommon learning interactions can be addressed using auditory, visual and even tactile sensory feedback.

4.1 Introduction

A number of evidence-based educational underpinnings can be identified and addressed when using VR. These include constructivism, andragogy, heutagogy, tacit knowledge, learning styles and preferences, experiential learning, critical thinking,

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reasoning and judgement, the reflective learner, skills and competency development, self-efficacy and deliberate practice (Shepherd 2017; Simulation Framework App—App stores). A further value-add is the ability of a VR experience to provide a standard of learning and a capacity for repeated exposure to the learning activity. This is invaluable from an access and equity perspective, and the capability to help close the theory to practice gap through simulated scenarios based on real-life experiences, thus preparing the learner to be more work ready and safe.

The development and delivery of online learning in most courses still requires delivery of content-specific knowledge to a prescribed curriculum. This is commonly afforded through an array of interactivity through readings, tutorials, videos and chat rooms. However, with the inclusion of VR into the mix of learning and teaching activities in both undergraduate and postgraduate courses, the opportunity for a more immersive, interactive, experiential learning experience that can be scaffolded from simple to complex and focused on strategic learning needs has the potential to significantly augment the cognitive, practice and attitude development of the learner. Thus, VR as an integral part of the online learning experience is a crucial consideration in the professional preparation of the future twenty-first-century employee.

The strategic use of immersive interactive learning technology as a teaching, learning and assessment method is rapidly expanding across a wide range of industries (Shepherd, 2017). From a healthcare education perspective, simulation, with its wide range of applications, including Virtual Reality (VR) is increasingly penetrating and influencing the preparation, professional development and continuing education requirements of most disciplines of the healthcare workforce (Blum, Borglund & Parcells, 2010; Bogossian et al., 2014). In the Psychological Sciences, the use of VR as a simulation-based activity is beginning to gain traction as a platform for the experiential learning about, and addressing issues that challenge existing learning strategies and processes (Adery et al., 2018; Valmaggia, 2017).

Meanwhile, it is not only healthcare engaging in the use of VR. As an example of where there is significant investment happening, an extremely important area keen to improve participants' outcomes is the defence industry. A recent online commentary indicates that 'technology is revolutionising the business of being a soldier' and that future soldiers will be increasingly exposed to VR experiences in efforts to support their initial training with repeated practice and ongoing preparedness, reducing training accidents, including their resilience in dealing with changing circumstances, and from a government perspective, operational costs (www.soldiermagazine.co.uk, 2019). Given the diversity of how VR use is emerging, this then suggests that it is important to further ascertain as to what VR is and in what contexts is it being considered and applied, especially from an e-learning perspective.

4.2 Definition

According to Bardi (2019), Virtual Reality (VR) is 'the use of computer technology to create a simulated environment … (unlike traditional user interfaces) … VR places

the user inside an experience. Instead of viewing a screen in front of them, users are immersed and able to interact with 3D worlds. By simulating as many senses as possible, such as vision, hearing, touch, even smell, the computer is transformed into a gatekeeper to this artificial world'. This is supported by Brooks (1999) who sees a VR experience (as a branch of computer graphics) as 'any in which the user is effectively immersed in a responsive virtual world. This implies user dynamic control of viewpoint'. Rizzo and Shilling (2018) also see VR as an advanced form of human–computer interaction. Thus, the participant is fully connected to and is interactive with this virtual setting—as if it were a real experience. This is pivotal to the use of VR in teaching, learning and research.

4.3 Development of VR

A range of applications is emerging as VR becomes more affordable and mature, with a wide range of options being available. Stenger (2017) identifies 10 different ways VR is already being used in education. According to Stenger (2017), these include 'virtual field trips, language immersion; skills training; philosophical theories; architecture and design; special education, distance learning; improved collaboration; game-based learning and virtual campus visits'. Leadem (2017) also identifies 12 uses that immersive VR technology is already impacting such as in dentistry; staff development; paraplegic rehabilitation; post-traumatic stress; medicine, nursing, social sciences; pain management; anxiety; autism and social skills; business; architecture; car safety; and planning vacations. Many of these have evidence of outcomes. Meanwhile, Babich (2018) while commenting on how we learn today discusses how VR will change, how we will learn and how we will teach. Importantly, Babich mentions how scale can be addressed in medium and that learning through VR is more dynamic and that VR is more engaging.

More importantly, the publication of user profiles, outcomes and potential use in research is emerging, along with requests for clearer understandings of definitions and underpinning concepts. Sanchez-Cabrero et al. (2019) report on the sociodemographic profile and interest of those using VR as a teaching and learning tool. Rizzo and Shilling (2018) meanwhile review the use of clinical VR tools in the prevention, assessment and treatment of post-traumatic stress disorder. This work follows the publication by Parsons and Rizzo (2008) who undertook a meta-analysis that looked at the affective outcomes of VR exposure for anxiety and specific phobias. From an educational perspective, Madathil et al. (2017) in an empirical study identify that the use of VR has the potential to improve the learning experience by actively engaging users.

Of interest, some disciplines are now identifying there is emerging some confusion and apprehension about the levels and intent of the various definitions being offered, requiring clarification especially around its various states of immersion and the potential impact VR provides (Kardong-Edgren et al., 2019). This is an important consideration as others are exploring the role VR will have in research. Given VR

is a method of simulation, which has been used in translational research (Grealish et al., 2019), El Beheiry et al. (2019) believe that 'data treatment and numerical simulations, especially those mixing interactions with data, human cognition, and automated algorithms will be the future of VR in scientific research' (p. 1315) and look at approaches that engage VR in scientific research using tangible examples.

4.4 Rationale for the Use of VR in Education

There continue to be challenges in how the theory–practice dichotomy that is seen in many courses is best addressed (Abbott & Collins, 2004; El Hussein & Osuji, 2017). There have been many solutions offered, and yet there remain issues around completion of studies and work preparedness (Bloomberg, 2015; Jackson & Chapman, 2012). Indeed, organisations are seeking strategic solutions. As an example, Demarinis et al. (2019) on the Deloitte Insights website identify the potential of VR to improve learning and training outcomes by rapidly, smoothly and effectively expediting the process of turning novices into experts.

This disconnect is increasingly being exacerbated as more and more educational strategies in how to more effectively engage with, and maintain students in, courses are introduced. A significant move in course and unit delivery is the use of digitally based learning platforms. More and more units of study are being delivered through a digital (online) learning platform in efforts to offer student choice and flexibility in learning, while also providing more student enrolment opportunities. Given these contemporary changes in the more traditional approaches to teaching and learning, the need to ensure that evidence-based, pedagogically driven levels of authentic learning are being delivered becomes an important consideration. The quest is to provide a platform of learning that supports and helps close the theory–practice gap, in the absence of opportunities to achieve this in real-world settings.

This includes the potential of VR to augment the online course content using computer-generated simulations of realistic immersive, interactive three-dimensional (3D) images, ideas or environments, using specific electronic equipment. By developing pivotal, strategic VR-based learning activities, difficult theoretical concepts or uncommon learning interactions can be addressed using auditory, visual and even tactile sensory feedback. This is supported by Peck (2018) who identifies three potential applications—scenarification, where learning content is converted to a scenario; e-Trips, or virtual field excursions; and interactive VR classrooms—that individually and collectively support e-Learning. The important consideration is to identify clearly that the potential use of VR will benefit the educator and the participant in ways traditional approaches are not. This requires a review and mapping of the course and unit content to ascertain where, why, when and how VR will be of value.

4.5 Educational Drivers

From a pedagogical perspective, the development of a VR intervention requires the same considerations as a real-life learning situation, where a constructive alignment process needs to be followed, with learning objectives and intended learning outcomes (ILO) identified, assessment of the learning determined based on those, and the specific content from the unit of study acknowledged, prepared and delivered to meet both the ILO and the assessment activity.

A number of evidence-based educational underpinnings can be identified and addressed when using VR. These include social and cognitive constructivism, andragogy, heutagogy, tacit knowledge, learning styles and preferences, experiential learning, critical thinking, reasoning and judgement, the reflective learner, skills and competency development, self-efficacy and deliberate practice (Shepherd, 2017; Simulation Framework App—App stores). A further value-add is the ability of a VR experience to provide an evidence-based standard of learning and a capacity for repeated exposure to the learning activity.

Such a resource can provide the learner with multiple opportunities, in a safe environment, to make mistakes, correct them and help identify any outstanding theory–practice issues. The capability to then help close the theory to practice gap through repeated simulated scenarios based on real-life experiences is advantageous as this is preparing the learner to be more work ready and safe. This is also invaluable from an access and equity perspective allowing more students with varying needs to all have an opportunity to be exposed to the same learning activities.

4.6 VR and Online Learning

The development and delivery of online learning in most courses still requires delivery of content-specific knowledge to a prescribed curriculum. This is commonly afforded through an array of interactivity through readings, tutorials, videos and chat rooms. However, with the inclusion of VR into the mix of learning and teaching activities in both undergraduate and postgraduate courses, the opportunity for a more immersive, interactive, experiential learning experience that can be scaffolded from simple to complex and focused on strategic learning needs has the potential to significantly augment the cognitive, practice and attitude development of the learner. While Gijevski (2017) leads a web discussion on will VR revolutionise online education, Barnard (2017) acknowledges this possibility in a blog discussing how VR can improve online learning. Merry (2016) too supports the notion that VR has the potential to have a positive impact on online education classes.

Importantly what needs to be consciously and repeatedly considered is the need to maintain the educational priority to the technological application. Lynch (2019) recognises this in commenting, ‘one of the biggest downsides of this technology is

that there isn't yet a way to include it without pulling the learner from the course environment. As such, this current application of VR technology to online education can only be considered a supplementary teaching tool, not a primary teaching platform'. Cowling (2019) too recognises the need to be careful in how it is used in a position commentary around pedagogy before technology. Thus, for VR to be an integral part of the online learning experience, making sure the unit content and education–technology interface have validity and reliability is a crucial and strategic consideration in the professional preparation of the future twenty-first-century employee.

What will be pivotally important in future constructive alignment activities where VR may be used will be the deciding on what the assessment activities might entail. To reiterate, VR like other simulations remains a simulation-based teaching and learning method, so how one would assess any simulation activity and outcome would need to be contextualised. The importance is paramount given the VR experience is offering an authentic learning activity that is close to a real-world one, so the assessment has to be one that also addresses authenticity, how it addresses key factors such as sustained student engagement, deep learning and reflection, academic rigour and integrity, contextual and relevant employability skills, emotional intelligence, resilience, self-efficacy and importantly contemporary and evolving industry needs (Jopp, 2019). While this is a challenge for the educators designing such deliveries and assessments, by being aware of these requirements, the assessment aspect can be designed appropriately—and will especially correlate with the online learning environment.

4.7 Emerging VR Education Research Outcomes

There are research outcomes emerging to support the use of VR in education. Valley (2018) identifies three ways VR training is producing better outcomes, while Ventsias (2018) reports on a study that demonstrates people recall information better through VR. Meanwhile, Schaffhauser (2019) reports on a recent study that indicates there was no difference in VR learning outcomes compared to the other two modes provided, which were a hands-on activity and a desktop computer simulation. While this can be interpreted in a negative way, the fact that there were no differences means other factors can be considered, such as access and equity, time and motion, logistics, costs and importantly, retention and decay issues. Importantly, the education research undertaken by Madathil et al. (2017) in a manufacturing environment dealing with safety hazards demonstrates significant improvements using VR, in the areas of ease of comprehension, ease of memorisation, usability and active learning. These findings are valuable in understanding and guiding future endeavours, especially using VR in the online learning environment.

4.8 Reflections and Recommendations

At this juncture, it is of value to first consider how much material has been published around VR to date. As late as November 2018, researchers have accumulated a bibliographic dataset of over 21,667 records for VR and over 9000 for augmented reality (AR) and discuss past, present and future capabilities and challenges (Cipresso et al., 2018). This record allows for a range of recommendations and guidelines for future use to be considered and developed.

From a simulation education perspective, the strongest recommendations include being open to the use of, and educationally prepared for, this emerging, disruptive digital technology as part of the choices in any future design, delivery and evaluation and assessment of courses; be prepared to use your imagination and rigorously look into the curriculum, course and units to where VR might be of value to enhance and improve current activities; applying constructive alignment principles and practices to ensure learning outcomes will be addressed and met—and measured appropriately and effectively; to ensure the pedagogy always drives the technology, and be open to planning for it (VR) and to always consider how the use of VR will enrich both the educator's professional development and the student's learning outcomes.

Given that VR is in education reality another teaching and learning method, the guidelines should not be different to any other method used, except for ensuring that its application is contextualised towards the subject matter in a way that the participant can more effectively begin to close the theory–practice gap. The use of immersive learning is not without risk, so from a governance and quality perspective, ensuring awareness of, planning for, addressing and mitigating risk factors is of paramount importance. Finally, embedded in the references provided in this chapter, there are a number of lessons learnt, recommendations and guidelines noted by the authors, and it is recommended that these be followed up.

4.9 Conclusion

Anecdotal presentations via online blogs and media along with evidence-focused publications in the literature is demonstrating that the use of VR is being increasingly considered and used in an array of disciplines, environments and approaches in efforts to address current and emerging learning, practice and preparedness issues. It would appear that as the technology is developing and becomes more responsive from an immersive and interactive perspective, it is attracting the attention of a diverse range of individuals, businesses, organisations and services—and much exploratory activity is underway.

How VR may be developed and used in the context of online learning remains in its infancy, and maturity warrants further investigation and exploration, from both an educational sense and a strategic focus. How we best assess its impact and effectiveness will be vitally important also. From an educator perspective, the use of an

immersive, interactive, experiential activity that reinforces a pivotal learning requirement is invaluable—especially if it addresses core principles and helps the participant make the connection between the theory and the practice more effectively in a timely manner.

Using VR to complement and enhance the online learning experience is of significant benefit to the participant as it provides opportunities for diversity in a range of learning approaches and choices, reinforcement of contextualised information, learning and practicing in a safe environment, and an ongoing capacity to revisit and continuously reflect on and apply this learning in a range of contexts.

This benefits the learner's cognitive and metacognitive capacity and capability, self-efficacy and resilience, emotional awareness and subsequent employability and transferability of technical and human factor skills into and across the future work environment. How, when, when and where the VR experience is designed, delivered and assessed will be strategic in ensuring VR is a positive change agent that improves the student experience and outcome.

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Chapter 5
Learning Design Meets Service Design for Innovation in Online Learning at Scale

Marcus O'Donnell and Lucy Schulz

Abstract Carvalho and Goodyear (2018) have recently argued that design work in higher education has fragmented between administrative macro-level planning and the micro-level work of learning design. They call for a new approach that connects 'macro, meso and micro levels' of design thinking for educational change. This paper describes a series of macro, meso and micro design strategies that have been developed during the formative development of Deakin University's 'Cloud Campus' which delivers 160-degree programs to more than 15,000 students. This process has been informed by insights into design thinking with its specific focus on the user experience and involvement, and iterative, agile practices. This approach has allowed the development of a more in-depth appreciation of the experiences, expectations and 'pain points' encountered by students at each stage in their learning journey. This case study will focus on the work to develop a number of specific postgraduate degrees using an open course platform, FutureLearn. The case study explores a four-part framework that integrates learning design, service design, team design, and portfolio design combining institutional, academic and professional approaches to the delivery of premium online learning. Evaluation of this approach has shown an improvement in student retention and is significantly impacting on teaching and learning practices at Deakin more broadly.

5.1 Introduction and Context—A Case for Change

Like many other industries, higher education is currently facing digital disruption brought on by the advent of the fourth industrial revolution. This has caused calls for a reconfiguration of both business models and academic practice (Aoun 2017; Seldon & Abidoye 2018; Smith 2018). However, unlike some industries, print media,

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for example, tight government regulation and public funding models for universities have cushioned any catastrophic disruption to their viability. But the challenge for universities is a double one: first, how do institutions adapt their own businesses to the demands of increasingly globalised digital competition; and second, how do they deliver education that equips their graduates to deal with the complexities of the fast-evolving digital future of work. These issues have now been exacerbated by the recent COVID19 crisis which has added considerable stress to a system already experiencing disruption.

Navigating this world of tight regulation on the one hand and digital disruption on the other demands a strong focus on both innovation and quality assurance, and in a recent survey of senior university leadership (Ellis and Goodyear 2019) the tension between these two areas was identified as the 'single most substantial area of concern' (136).

> From the interviews undertaken, there seems to be a better grasp of what a quality framework involves for course development and the student experience, but there is some uncertainty about how an accompanying innovation framework is best structured and integrated. The challenge for an integrated innovation framework lies somewhere in the space between encouraging creativity and risk-taking, while at the same time not undermining a systemic approach to standards. (Ellis and Goodyear 2019: 68)

The case study in this chapter documents how one university sought to address this tension between a creative approach to digital innovation on the one hand and a strategic approach to standards-based quality assurance on the other. It proposes that program-level design thinking offers a unifying framework that allows innovation to be scaffolded through an iterative engagement with a holistic set of standards. In the next section of this paper, we briefly contextualise this approach that we call *Degree Design Thinking* with reference to both the broader design literature and approaches to design within education. We then present a case study of the Deakin Degrees at FutureLearn project and place this in the context of earlier work focused on mapping the student journey. Elements of the Degree Design Thinking model have informed each of these projects and the model itself has evolved iteratively from this work through an active attempt to reflect on and theorise practice. We conclude with recommendations on how this model might be useful in other digital learning innovation projects.

5.2 Design in Education and Design Thinking

Design in education has a long history across curriculum design, learning spaces design and technology design. Laurillard has described teaching as a 'design science' (Laurillard 2012) by which she means it is an evidence driven approach to developing replicable and iterative 'heuristics for practice' (2012: 1) through an implementation, review and improvement cycle. As Carvalho and Goodyear (2018) note the design tradition in education is 'pragmatic' and inward looking and has not integrated with or made a substantial contribution to the wider design literature.

Two approaches to design in education within this pragmatic tradition have been particularly influential. First, *instructional design*, which emerged from the educational media movement and military attempts to design effective training programs (Reiser 2001), has a strongly organisational focus, which stresses rule focused efficiencies and high level 'alignment' or congruence between goal, strategy and outcome. Second, the influential work of (Biggs & Tang 2007) on 'constructive alignment' emphasises mapping high level outcomes to ensure a scaffolded movement from lower level to higher level skills development. Carvalho and Goodyear (2018) argue that this history has led to a focus on the macro and micro level—either high level planning or detailed task design—rather than an integrated approach which connects macro, meso and micro levels. They call for more attention to service design as an integrating factor (Carvalho and Goodyear 2018: 31).

Recent approaches to *learning* design rather than *instructional* design have emphasised the importance of a creative approach to identifying and working with broad learning design patterns (Bearman, Lambert & O'Donnell 2020). In this context, a design *pattern* is described to assist development and sharing of replicable sets of learning activities, but importantly: 'a pattern is a solution to a recurrent problem in a context' (Goodyear 2005: 93). Various educational practitioners have sought to operationalise this notion of a pedagogical design pattern. This work ranges from tightly specified machine-readable patterns that structure technology enhanced learning environments to more descriptive and discursively open task designs (McAndrew et al. 2006). The attraction of a reusable design pattern is, at one level part of the pragmatic tradition noted earlier. As Goodyear, Carvalho and Dohn (2014) write: 'Investing time in design pays better returns for the teacher (and learners) than having subsequently to spend time animating, repairing and redirecting activities' (139). However, at another level, if used flexibly and creatively rather than mechanistically, it can be seen as critical to supporting sustainable innovation at scale and extending the capabilities of teachers as designers. Laurillard (2012) has argued that the shareability of commonly understood design patterns is essential to building capability through creating a language for evidenced-based practice in teaching.

Broader design scholarship can help us to conceptualise further how to better connect the macro, meso and micro levels of educational design and how to move from purely pragmatic approaches to more wholistic understandings of design. Design is a broad pluralistic discipline that includes traditional approaches to object design as well as design of organisational structures, services and public policy. Design thinking has emerged as a useful cross disciplinary way of understanding how design underpins a variety of professional practices. While a variety of 'design thinking' models have emerged (Johansson-Skoldberg et al. 2013), in general it refers to the processes underpinning the act of designing and highlights the importance of user-centred and iterative processes. A number of scholars (Dorst 2019; Buchanan 2016) have recently suggested that current design practice is shifting in significant ways across each of these levels. Buchanan argues that 'design is undergoing another radical transformation, a turn toward action, services, and management' (Buchanan 2016: 17). The Dutch government, for example, have initiated a large-scale design project, *Redesigning Psychiatry*, to reimagine the country's mental health system

(Dorst 2019). This type of 'design problem' creates new challenges for traditional design epistemology and praxeology. Such system level design thinking requires a new set of sophisticated tools and approaches that move beyond the prototype-iterate problem solving cycle of first generation designerly approaches.

It effectively means going beyond any simple understanding of a problem/solution approach, even an iterative one. Because in confronting a 'wicked' or highly complex situation or system 'there IS no solution—the way to achieve progress is to create high-quality *interventions* to bring the whole system forward into a more desired state' (Dorst 2019: 122). In reviewing the Dutch program, Dorst suggests this means moving to a 'design-driven program of activities, rather than a design project' and entails 'a multi-year approach, comprised of sub-projects in which multiple stakeholders have roles that vary over time' (Dorst 2019: 124).

5.3 Degree Design Thinking: A Case Study

Our approach to *Degree Design Thinking* draws on many of the tools of traditional design thinking but also adopts the wider model of program level design thinking where a series of related sub-projects lead iterative multi-year developments across a connected program of work. The model itself has grown iteratively as we explored and evaluated our approach at key points. Initially, our primary concern was the development of learning design processes using Laurilard's learning activity types (Laurilard 2012). We knew this had to be matched with a focus on producing a seamless student experience and this work drew on evolving notions of service design. As the project developed, through periodic reviews and evaluation processes and through being asked to articulate what we were doing in external presentations (O'Donnell and Schulz 2018; Oliver 2018; Bearman et al. 2018), a four-part framework for designing online degrees emerged.

- **Portfolio Design**—that ensures an integrated mix of courses, pathways and macro and micro-credentials
- **Team Design**—that enables effective work practices and collaboration across academic and professional staff
- **Learning Design**—that enables task focused, social learning design and authentic assessment.
- **Service Design**—that ensures a student-centred, journey-driven approach to a seamless user experience.

However, this is a broad framework rather than a prescriptive model in the sense that at each level it draws on and incorporates a range of other tools and techniques. Each layer of design adopts a varied set of approaches. So we make a distinction between different designerly ways of working across the program:

- **Design Thinking**—which has inspired our creative, iterative, user-centred approach

- **Design Patterns**—which allow us to identify and replicate useful interactions across the program; and
- **Design Tools**—which are a broad set of techniques that have enabled our work practices.

The Degrees at FutureLearn project saw Deakin become the first university to launch a suite of degrees on a global open/MOOC platform. While early boutique initiatives such as the iMBA from the University of Illinois Urbana-Champaign on Coursera had shown that a mix of MOOC tasters leading into full paid degree programs were possible, Deakin's work with FutureLearn was the first initiative to offer a coherent suite of six nested degrees in this open environment, bringing a new model of global online education to market. This ambitious program was developed quickly with our first degrees launching within six months of signing with FutureLearn. It was only possible to work at pace in this way because of the pre-existing thinking about student focused online learning that had taken place through a range of innovation projects at Deakin over the preceding 5 years. The FutureLearn project in turn led to the next innovation cycle at Deakin. This case study is therefore in three parts:

- Beginning an approach to student journey mapping
- Designing Degrees@FutureLearn
- Towards a holistic understanding of CloudFirst Degree Design Thinking.

5.4 Beginning an Approach to Student Journey Mapping

Deakin University has a long history in successfully providing distance education. Like many institutions, when it shifted to teaching online the platform was changed but much of the content and format remained similar to distance education offerings. This reflected a focus on an information delivery model rather than using digital technologies to provide tailored interactive online learning.

Deakin offers one of the most comprehensive online offerings of any university in the world with all disciplines offering some online content. It currently has 15,000+ online students. This has only been possible through an integrated approach to located and online offerings. With recorded and some livestreamed lecture recordings it became possible to invite online students into our located classrooms. However, there is an inherent tension in this dual campus/online delivery model with many courses offered in both modes often involving the same teaching staff. Deakin developed minimum standards for online delivery to reflect good practice (Stone 2016). The minimum standards ensured, for example, that students enrolled online could access video recording of classes (broadcasts of the campus experience), had some equivalent opportunities for interaction and could seek support and ask questions. However, this focus on *equivalence* used the located experience as the benchmark rather than developing new models that delivered a tailored online experience that

met both the specific needs of online students and leveraged the unique affordances of digital technologies.

Student retention in online courses continues to challenge universities with attrition rates generally 10% or higher than for students in the same campus delivered offering (Bawa 2016). There are often sound reasons for this, notably the priority attached to study in the busy lives of these students who tend to be part time, mature age, working people. While there are reasons to accept this result, we also knew from internal focus groups with atritting online students that there are a number of ways universities could support them better, for example, greater flexibility with assessment timelines and availability of services outside of traditional working hours.

In 2014, to begin to address these issues Deakin began work to map the student journey: the highs and lows, the processes and the pain points, as a way of informing a whole of institution approach to our vision for the student experience. This culminated in the Student Learning and Experience Plan (Deakin 2016) [SLE Plan], and a set of five goals focused around different stages of the student experience.

The original SLE Plan noted several factors influencing higher education internationally that underpinned the initiatives and solutions offered in the Plan. These included the changing business models of higher education internationally; the potential disruptive influence of MOOCs; the volatility of international student mobility and the increasing competitive market for online students across traditional and private providers. In the Australian context the introduction of the Higher Education Standards Framework in 2017 was also noted as a key quality assurance layer that needed to be addressed at every level of the plan. The SLE Plan therefore brought together a focus on both a set of 'wicked-problems', which demanded innovation with a commitment to high levels of quality assurance. In this early work we can now

Fig. 1 The five goals of the Deakin Student Learning and Experience Plan guided mapping of the student journey

see the beginning of an evolving approach to *Degree Design Thinking*: identifying the 'wicked-problem' set; iterative projects; cycles of development and consultation; a user/student-centred approach and the introduction of several UX research tools such as prototyping and journey mapping.

We also acknowledged the diversity of experience for various cohorts especially the range of non-school leavers and the somewhat invisible but ever-present Cloud Campus students. These students needed flexible, modularised learning that fitted with their demanding lives and provided targeted professional learning. We engaged in a number of innovations including:

- **Start Anytime**—a pilot project streamlining processes to allow students in selected large units to begin and finish their study at 'anytime' throughout the year, with 10 starting points creating a series of new academic calendars.
- **Micro-credentials**—a series of standards based professional practice credentials mapped to Deakin's graduate attributes. These allowed experienced professionals to produce portfolios of evidence that were assessed at three different levels equivalent to Bachelor, Pre-Masters and Masters level. These were offered as B2B and B2C products.
- **Professional Practice Degrees**—Nested Master suites which combined a small number of taught subjects, a capstone project and a number of micro-credentials. This provided a new form of accredited learning which assessed existing professional skill sets and provided an opportunity to reflect on and validate that learning.
- **Stackable postgraduate degrees**—improved pathways and nesting of postgraduate courses, which recognised student achievement and allowed multiple exit points for each nested course.

Our experiments with different forms of non-standard credentials had also included development of some MOOCs. In 2016, we began to think more deeply about the role MOOCs could play in our learning and promotional ecosystem and we looked to the existing global platforms. We were impressed with UK MOOC provider FutureLearn, an off-shoot of The Open University, who at that time ranked number four in global MOOC providers (behind Coursera, edX and XuetangX) with over 5 million registered users. While Coursera (23 million users) and edX (10 million users), potentially had greater reach, FutureLearn had clearly thought more deeply about the pedagogical framework of their offerings and had built a unique platform which prioritised the user experience, media rich artefacts and social learning. This matched our commitment to a user-focused student journey and quality online delivery.

5.5 Designing Degrees@FutureLearn

The FutureLearn platform was purpose-built to operationalise a certain type of learning design. The platform organises learning materials in sequenced modular

units. This modular organisation is related to the pedagogical vision of sequenced, conversational or social learning expressed through three key elements: telling stories, provoking conversations and celebrating progress. The other distinctive element of the FutureLearn approach is the formulation of key learning objectives as 'Big Questions'. A big question for each course is meant to inspire curiosity, expressing traditional learning outcomes in a way which will provoke conversation and motivate learner engagement. This is a critical shift in design thinking from a focus on top-level alignment to a focus on student engagement.

The new platform also gave us an internal operational advantage because we could frame this project to staff as an opportunity to work in a supported team on a new platform with a new model of learning design and service design. The scale and difference of the new product created a disruption to our business-as-usual model of incremental change. As previously noted, we moved very quickly from initial concept to the launch of the first degrees (within 6 months). Key decisions and actions that needed to be made included four key areas of work:

- What degrees would we choose to put on this platform and why?
- How would we develop new and repurpose old learning materials for this new environment?
- What teams would we require to support academics and others in delivering this new program?
- How would we ensure a seamless student experience and what integrations would we need with our existing processes and platforms?

Working with these four key questions eventually evolved into our *Degree Design Thinking* framework.

5.5.1 What Degrees?

To maximise the strategic impact across the organisation, each faculty was asked to identify a course for transformation and presentation on FutureLearn. Courses selection was based on opportunities for online growth, international relevance and demand. Academic staff with subject matter knowledge would be required and willing to review existing curriculum and learning resources to start fresh and re-build their courses and units. Four key degrees were chosen:

- **Graduate Certificate of Diabetes Education**: a small self-contained fully online degree with a tight dedicated staff, with rising demand within Australia because of the need for a range of health professionals to give advice in this area and potential for international growth because of the impact of diabetes throughout the world.
- **Master of Cyber Security**: a new offering that was currently under development in an area of trending concern and business importance

- **Master of Development and Humanitarian Action**: an area in which Deakin had recognised expertise and world-wide industry networks; members of the teaching team had been involved in one of Deakin's early MOOC experiments
- **Graduate Diploma of Property**: an area where there was growing demand for up skilling.

In addition, the relatively new professional practice degrees that included tailored credentials to recognise experience provided a different opportunity and allowed us to offer a different set of pathways for professional learners.

- Master of Professional Practice (Information Technology) later renamed to Master of IT Leadership
- Master of Professional Practice (Leadership) later renamed Master of Leadership

The modularised learning design of each subject broken into five 2-week blocks (see below) allowed us to also experiment with offering part of each degree free to open online learners as well as paid degree courses for enrolled Deakin students. This provided a free 'taster' for potential degree students.

5.5.2 What Pedagogy?

For the delivery of these courses, Deakin adopted a very specific model of learning design which matched the affordances of the new platform. It focused on what Laurillard (2012) calls learning activity types—read, watch, collaborate, discuss, investigate, reflect, practice and produce. This enabled us to model the learner experience in a detailed way, to make the process of design visible and enable academics from different disciplines to share this process through mapping specific *design patterns.*

The top-level pattern consisted of 2-week study blocks framed around FutureLearn's notion of a 'big question'. Each 2-week block unpacked 3–4 key concepts or professional practices through a progressive set of case studies, elaboration and active social learning. These learning elements were carefully sequenced across 12–16 learning steps that were clustered into smaller sets of connected activity bundles. This sequence of design patterns started with learner discovery and enquiry leading into a carefully sequenced series of learning tasks based on Laurillard's 5 learning activity types (Laurillard 2012). This built a strong carefully scaffolded narrative and a clear set of logical progress markers for students, enabling them to choose what chunks of learning they would do in the time available to them. Each component contained a cycle of a consistent learning design introducing academic content, followed by learner-focused activity and peer interaction presented as a 'Your task' challenge.

Earlier work in Deakin's Course Enhancement Project (Oliver 2015) to define and document course and unit learning outcomes helped in readily identifying the big questions for each unit and in turn for the five short courses which comprised a unit. A variety of tools and templates assisted learning designers and academics to work

together and understand the trajectory of the unit. A high-level learning design map, which traced alignment between subject learning outcomes, the big questions, and key concepts/practices across the five 2-week study blocks or micro-courses, enabled whole of subject thinking. A detailed learning design map, showing a sequence of typical learning patterns in each 2-week block, was used for detailed design. The design of each step in this sequence was further scaffolded with detailed templates for different pattern elements, for example, a template for an introductory video.

5.5.3 What Experience?

The pre-existing work on the student journey at Deakin which culminated in the SLE Plan also laid the ground work for our attention to the student experience in the FutureLearn project. In most universities—organisations built on the valuing of specific expertise—staff tend to know and focus on *their* aspect of the journey, which does not take into account how students engage with the institution as a whole. Goodyear and Carvalho building on systems thinking focus particularly on the role of the learner in co-producing the learning experience and in the network of relationships and interactions with the education service provider. In complex services such as education the service itself is coproduced through a combination of content in context, the team that design experiences to stimulate the learner and the interaction and engagement of the learner themselves. As they note: 'the service interface can be thought of, and mapped in detail as, a dynamic network of diverse humans and things co-producing a nested set of services'. (Carvalho & Goodyear 2018: 41).

Designing an offering on FutureLearn, which sought to mix large cohorts of free learners with paid enrolled degree students on a global platform, necessitated rethinking many of our standard student service interactions from nurturing leads through offer, acceptance, enrolment and supported onboarding as well as their supported passage through the degree. This demanded service design focused on simplicity, minimising friction points and focused on every specific interaction students have with the university to facilitate their confidence, demonstrate progress and achieve meaningful engagement and relationships with others, particularly staff and peers. Zomerdijk and Voss (2010) developed a series of propositions in their consideration of designing experience-centric services. These propositions include creating a dramatic structure and orchestrating the cues or impressions which customers pickup from their interactions with both our platforms and our people.

We were fortunate that most services and support were already equally available to online learners and that DeakinSync, a student portal, contextualised to specific cohorts including Cloud Campus students had been built with systems, information and personal tools integrated into the one place. Partnering with FutureLearn provided a team experienced in the use of agile project management and a strong commitment to the user experience which enabled us to build on this baseline. They were keen to learn about the degree journey including requirements where

they had limited understanding such as assessment, fees administration and degree management.

All core processes and their workflow were considered and challenged particularly by FutureLearn who could bring their external unencumbered perspective to the table. Each student touchpoint was identified as well as how data/information needed to flow between systems at each stage in the learner journey. Single-sign-on across all Deakin and FutureLearn systems was one of the key elements necessary to make it easy for students to move between the Deakin and FutureLearn environments. We were conscious of the different learner journeys that we needed to accommodate, for example, where learners would access basic degree information and where and when they may choose to apply including after completing a free open course or 'taster'.

The short timelines meant focusing on a minimum viable product for launch with a range of future improvements identified post-launch. Application and enrolment processes were simplified as were fees (a single fee for domestic and international online students) and students could move freely between their learning environment in FutureLearn and the student portal through single sign on. A new purpose-built orientation course was designed and implemented, and this is now a regular feature for all post-graduate commencing students. For other processes most notably communication directly with key teaching staff and degree/course level communication generally, which was new to FutureLearn, improvements were required post-launch. There was also a strong reliance on a number of manual back end processes to minimise friction for students.

This approach to coproduced nested design means that the work is always continuing to evolve. With all best intentions not all the original enhancements were realised once we formally launched the degrees. This work is ongoing as layers of complexity and different approaches, most with good intent relating to the specific disciplines and what works locally, require careful interrogation and change management to resolve.

5.5.4 What Team?

Working on all degrees and initial unit offerings concurrently meant a diverse group of people and expertise from across the University covering curriculum, subject matter experts and discipline leaders, digital learning design, multimedia production skills, project and change management, quality assurance, copy editing and writing, videographers and graphic design. There was also the team focused on the technology and service platforms which comprised an equally complex mix of expertise, and policy and process knowledge.

The team initially comprised a number of existing staff who were essentially reassigned to the project but as we better understood what was required new staff were employed to work specifically on the project. The enthusiasm was palpable but it did strain existing workloads particularly as this was hard to quantify in the initial stages of the project. The new learning design approach meant a cross disciplinary

and cross University team which was a very different way of working for many of the subject matter experts. For most this was a highlight for the project as everyone learned new roles and an appreciation of the different expertise required for purpose built online delivery.

Future projects have learnt from the experience and have resourced the work upfront although you will see from the learnings below that there are still some gaps. Notably, the effort involved upfront in engaging in the challenging conversations about what a "premium on line offering" means, how existing workloads can accommodate new ways of thinking about teaching and learning, and how it can be reconciled with discipline-based ways of teaching. Early evidence showed signs of improvement in student satisfaction and success and some units showed improved retention (Bearman, Lambert, O'Donnell, 2020) which contributed to higher levels of acceptance by staff.

5.6 Towards a Holistic Understanding of CloudFirst Degree Design Thinking

As the project progressed our thinking about a four-part framework capturing our ideas and holistic approach to the student learning experience took shape. This model has informed future 'CloudFirst' initiatives as a way of understanding a whole of system view of the change and development work needed.

The Table 5.1 summarises this emerging framework and shows how a number of design patterns and tools were utilised across each layer.

Ultimately our work in this project was to improve the student user experience and therefore improve student learning outcomes and early indicators are that this has to some extent been achieved. An evaluation completed for the project found that more students successfully completed these units (Bearman, Lambert, O'Donnell, 2020). The institutional impact has been equally significant. Since the initial project, a number of institutional initiatives have continued to embed and share this CloudFirst approach. It now underpins new Principles for Premium Learning and Teaching which have been adopted by the university as part of Deakin's Higher Education Courses Policy.

5.7 Recommendations

Recommendation 1: Focus on Macro to Micro and Micro to Macro Planning

The framework is highly interdependent and requires an iterative design thinking approach with ongoing reflection at each level—macro, meso and micro. Each level requires its own tools and templates and this facilitates engagement and showing people what change looks like. A lot of work is needed to develop and iterate new

Table 5.1 Design types, outcomes, problems, patterns and tools

	Outcomes	Design problems	Ways of working—Design patterns and tools
Portfolio design	Bringing to market a viable suite of educational products that address defined community needs and that can work together as a set of cohesive pathways and deliver premium digital educational experiences	• Diverse approaches to credentialing including micro-credentials and degrees • Targeting local and global markets with open and paid products • Balancing innovation and regulatory constraints	Models and templates in this field were least developed and relied on • Traditional distributed governance model • Policy frameworks • Micro-credential standards template
Team design	Harnessing and supporting multidisciplinary teams to maximise the diverse expertise necessary to deliver premium digital educational experiences	• Changing academic cultures which privilege content knowledge expertise • Development of inclusive teaching teams: academics, learning designers, administrative staff, multimedia producers • Developing learning facilitators as well as content delivery	• RACI framework to allocate: responsibility/accountability/consults/inform • Capability resource hubs—Digital learning and CloudFirst101 • Teaching Capability Framework using international standards • 'Third space' theory (Whitchurch 2012)
Service design	Providing a premium set of personalised, digital + human interactions which seamlessly choreograph services to deliver supported premium digital educational experiences	• Seamless and simple learner experiences including student administration processes • Support including learning to learn resources and coaching • Just-in time and personalised	• Journey mapping • Personas • Design thinking • Policy prototypes
Learning design	Choreographing, a purposeful set of digital + human learning interactions that engage learners in developing and deepening their knowledge and skills through premium digital educational experiences	• Moving beyond constructive alignment • Micro-task design that builds a learning narrative and scaffolds social learning • Engaging multimedia • Authentic assessment	• Laurillard's activity types • Custom designed Templates • Big questions • FL Platform affordances—positive constraints

ways of working with a set of tools and templates that modelled clear design patterns. For example, we found that often templates which were meant to scaffold new ways of working were sometimes regarded as constraining by academics and designers used to working with much more unstructured models of curriculum development and these have to be iterated to best service both the processes and design.

Recommendation 2: Focus on Student Experience and Both Human and Platform Cues

Finding multiple ways to map, understand and listen to the student voice ensures a focus on the right things, paying attention to what matters at all stages of the student experience. Small moments of experience matter and these can be understood by looking for the external cues/clues/impressions that students pick up from interacting with our platforms and our people. What might appear as small issues can have a big impact on the student's ability to continue unimpeded in their learning journey; it can be significant or even a 'deal breaker' for the student.

Recommendation 3: Focus on and Plan for Change Management

Strong executive leadership is critical to ensure a willingness to simplify and tackle the layers of complexity. But the voice for change must came from across the organisation and the student voice provides a compelling rationale and tangible opportunities for change to complement and provide meaning to the executive level commitment and support. The process of change (and communication) requires considerable effort and therefore resourcing with leadership at the right level of authority with a strong mandate. Commitment to the principles of multiple iterative developments and realistic aims for interim steps such as launching with a 'minimum viable product' assist a stage approach to change.

Recommendation 4: Secure Dedicated and Sufficient Funding

Significant and specific funding is needed to resource the set up and ongoing operational work of such a complex program of work. This funding needs to flow to multiple places and at multiple levels in the organisation with an eye to ongoing and sustainable delivery of outcomes and benefits. Digital learning experiences are now compared with the range of other digital platforms in students' lives: platforms and designed customer experiences resourced with multimillion-dollar budgets.

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Chapter 6
An Online Education Toolbox

Zahra Aziz and Stephen McKenzie

Abstract Advances in technology and in associated online education technological capacities are contributing to the rapid growth and increasing effectiveness of online education. The rapidly expanding digital landscape is allowing online education to achieve equivalence and in some ways beyond equivalence with traditional learning, including by enhancing collaborative learning opportunities and by removing geographical and other barriers, including those relating to the COVID-19 pandemic, and providing a custom learning experiences for varied learners. Increasingly commonly used online education features include state-of-the-art Learning Management Systems, eWorkbooks, teleconferencing systems including Zoom and eTutorials. Emerging online education features include open-source collaboration frameworks such as the HTML5 Package (or H5P), simulation and Artificial Intelligence (AI) features. This chapter describes some increasingly widely used and also emerging online education technological features, as convenient resourcse for online education developers, teachers and students.

6.1 Technological Advancement and Innovations in Online Education

Online education has seen tremendous growth in recent years (Grinder et al. 2019) and this growth has recently been accelerated by the COVID-19 pandemic. Advances in information and communication technology supporting online education have helped to accelerate the delivery of educational curricula outside of traditional classrooms and help online courses provide their students with an optimal balance of study and potentially competing life priorities including work and family (Croxton 2014). Furthermore, the recent growth and rapid expansion in the development and use

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of digital technologies have been instrumental in the creation of virtual campuses, transforming the everyday student experience (Bennett et al. 2015).

Digital technologies such as tablet computers, smartphones, interactive whiteboards with multimedia functions (internet access, images, sound and video files), robotics, 3D printers, social media platforms, professional broadcasting communication equipment, gamification tools, augmented and virtual reality applications and wide variety of other educational software programs have contributed to this digital revolution. Mobile application development and cloud computing have further paved the way for online education, opening doors for need-based, self-paced and self-guided learning.

There are a variety of ways that educational technology is defined in the literature (Kurt 2016). In its simplest form, it is 'the disciplined application of knowledge for the purpose of improving learning, instruction and/or performance' (Spector 2015). Kurt describes the evolution of the definition of educational technology over the last half-century (Kurt 2016), from learning processes (Ely 1963) to a field facilitating human learning through learning resources and processes (AECT 1972), to the use of educational technology as a conceptual framework (Davies and Schwen 1972) to a theory and practice of design, implementation and evaluation of learning resources and processes (Seels and Richey 1994), to a study and ethical practice of dealing with technological processes and resources (Hsu et al. 2013).

The ever-evolving nature of the field of educational technology has not only changed the traditional approach to teaching but it also provides innovative ways to allow learners to engage and interact with learning content, enhancing the overall learning experience (Antonenko et al. 2017). Online education programs can be valuably supported by educational technological tools that are specifically designed with an understanding of the desired students' experiences, which are easy to adopt, and are scalable. The remainder of this chapter describes some valuable online education technological tools which recent educational technology advances have allowed and which together can help develop student-centric customised experiences and create optimal virtual learning classrooms, learning communities and campuses.

6.2 Learning Management Systems (LMS's)

The growth and expansion of education technology and its increasing adoption and diffusion worldwide have led to the development of learning systems that have revolutionised the delivery of academic content, both in blended and online learning spaces. In higher education, this need is fulfilled by the creation and implementation of learning management systems such as Moodle, Opingo and Canvas.

Learning Management Systems (or LMSs) are defined as a 'software application for the administration, documentation, tracking, reporting, and delivery of educational courses, training programs, or learning and development programs' (Ellis 2009). Online LMSs have emerged from the concept of 'e-Learning' that focuses on utilising electronic technologies and resources in accessing educational curriculum

online. Since its first emergence in the late 1990s, continuous efforts have been made by the education community for enhancing its design, resulting in tremendous growth and development in online education. The opportunities and interest in its development and collaboration between technology developers, educational designers, teachers and educational administrators have enabled continuous improvements and innovations in this space (Watson et al. 2015).

Traditionally, LMSs are used by universities globally to deliver educational content and facilitate the administration of educational programs. Through the implementation of modern learning systems, there is a huge opportunity to mirror an equivalent on-campus or traditional classrooms experience for students enrolled in online or blended learning courses.

The widespread adoption of online LMSs is influenced by several important factors such as modern education interfaces, student-centric course design and structure, online assessment methodologies, opportunities for social presence through discussion forums, and integration of gamification technologies (as an educational approach) to enhance learning through video game design. Digital simulations or simulation-based learning that utilises the notion of 'learning by doing', provide effective virtual learning experiences aimed at improving both knowledge and skills of learners. Simulations also help teachers to easily and effectively explain otherwise difficult theories and concepts (Watson et al. 2015).

Students are at the heart of any learning system. The structure and design of academic content are presented within LMSs in a way that provides a personalised learning experience for students. Modern LMSs allow tailoring to each student's personal learning needs based on their interactions with the learning content, providing them with personalised learning plans as well as tracking their progress. For example, adaptive assessments feature categorised assessment questions based on each student's skills and provide tailored feedback based on their responses.

The most prominent feature of any online LMS is its use as a collaborative tool or a mini-communication network, where students and teachers interact by sharing ideas and information, and by asking and responding to questions in a self-paced environment. The ability to present interactive and collaborative content means that learners are more engaged with the content and can collaborate with other learners using the same platform. Additionally, built-in class discussion and networking forums enable flexible, local and social ways of learning for otherwise diverse and geographically dispersed learners and teachers.

The use of gamification tools in the context of education (such as scoreboards, ranking ladders and task completion badges), keep students motivated and engaged, and provide enjoyable ways for students to learn while engaging with the course content. Similarly, prototyping or 3D printing has been extremely beneficial in enhancing engagement through more concrete experience and interactive learning.

Mobility and accessibility of content are other important features of online learning systems, providing students with on-the-go access to course material from multiple devices including mobile phones. Also, the ability to access (and update) material to suit learners' and teachers' own flexible schedules provides unprecedented flexibility and convenience in tertiary education.

From the teachers' perspective, online LMSs provide a full suite of services to manage and deliver course content, for example, via built-in course templates that allow the maintaining of a consistent structure across individual courses. Some online LMSs also support the structure and layout of academic content through e-workbooks. e-Workbooks allow a highly structured way to organise the course content and provide flexibility to students to hover around resources when navigating the content.

Modern learning systems also support a variety of learning formats including text, audio, video and other interactive 3D materials. Interactive videos have increasingly been used in the delivery of online education creating a sense of cognitive and social presence connecting students with content (Garrison et al. 1999). Online students can play videos as many times as needed to understand a certain concept, offering an alternative approach to enhance their learning compared with static course materials. For teachers, online LMSs conveniently provide means of engaging with their students, particularly in off-campus courses where the feeling of isolation and disconnectedness is commonplace.

There are also numerous benefits of implementing an online LMS from course administrators' perspective. Many LMSs now provide an ability to present course quizzes, group activities, tests and assignments through online assessment activities. They also have an in-built capacity to automatically score certain types of online assessments such as multiple-choice questions, along with providing feedback and report creation, creating efficiency and cost-effectiveness in marking a huge number of students' assignments in a timely manner. Some special LMS features are described below.

6.2.1 HTML5 (H5P)

An important feature of online LMSs is their ease of integration with the HTML5 Package (H5P) that enables the creation and sharing of interactive educational content. Driven from the HTML programming language, it enhances the appearance of web pages by structuring and presenting the content in a clean and modern front-end design, as well as adding interactive activities within the content. For example, pop-up quiz question during or at the end of a video or advanced interactive activities such as virtually dissecting images to enhance learning. Being able to dynamically interact with educational videos engages learners with their content in meaningful ways than engaging with them statically, such as by reading from a textbook.

6.2.2 e-Assessments

LMS's assessment applications allow universities to move away from paper-based exams to more streamlined online assessments that are easier to manage, mark and

store. In addition to easy facilitation of exams, in some cases, it also enables tracking of the time spent on each exam question, as well as the ability to benchmark the results with other classrooms.

The ability of online LMSs to display students' progress dashboards indicating their engagement with the specific content and tracking whole class's progress is a valuable feature for course teachers and administrators, as it gives useful insights about the usability of content and students' engagement with it.

6.2.3 Student Communications

With minimal efforts by administrators, LMS systems can be set to send out automatic emails/notifications regarding important course-related dates and notices, and can keep a structured record of past discussions. Students are also able to self-serve basic admin tasks for themselves, saving course administrators' time. The ability to deliver and store results from a large number of learning materials, seamless reporting, and learning analytics generated from huge amounts of data collected through students' interactions with these online LMSs provide important education benefits, including personalised learning and helping students feel supported in their learning and a part of their learning community.

6.3 Mobile Apps

Mobile education applications (mobile apps) have transformed online education by expanding its reach and scale to diverse student populations. These educational apps provide interactive experiences for learners in the most user-friendly and creative ways. According to Statista 2019, mobile education applications have been the third most popular categories in the Apple app store, with the total time spent on educational apps continuously increasing worldwide.

Through an interactive user-friendly interface specifically designed to enhance learners' interaction and engagement with the given content, education apps can enhance the online learning experience and allow learners to engage with content at their own pace and time. The content provided by these apps needs to follow a careful and logical design to promote systematic learning. Some of these apps are also designed to enhance communication between learners and teachers as well as between learners. For example, online chatroom apps mimic face-to-face group discussions in traditional classrooms, online discussion board apps serve as physical notice boards placed in classrooms, instant notifications through mobile apps replace emails and written memos, and e-book apps replace hard-bound textbooks. Furthermore, the integration of Artificial Intelligence (AI), virtual reality (VR) and augmented reality (AR) features have further enhanced learning experiences through these apps (Brown and Green 2016).

6.4 eWorkbooks

eWorkbooks provide a convenient synthesis of all the learning materials students need to cover in an online course and could be seen as equivalent to the study guides that were once provided in earlier forms of off campus education. eWorkbooks use a text narrative to guide students through their learning experience and provide a conceptual framework for linked multi-media learning resources, including videos, structured learning activities, readings discussion forums and eTutorials. The eWorkbook narrative provides a context to learning material that is equivalent to what on-campus students would receive via their Lecturer. For example, students may be introduced to a particular topic via the narrative, emphasising its significance and relevance, and summarising up-to-date information. Students may then be asked to read a journal article presenting evidence on this topic, before completing a learning activity to consolidate their learning.

The organised nature of the eWorkbooks and their narrative means that students can efficiently focus on using meta-cognitive skills to reflect on, plan, and implement their learning (Khiat 2015). eWorkbooks provide structure and context to enhance online student's learning experience, and provide education intangibles that need to be present in online courses for them to provide an optimal education experience, including the what, why, and when students need to learn what they are asked to learn. The optimal eWorkbook format needs to provide a format that achieves a balance in the quantity and variety of material provided that meets the needs of various learners.

6.5 Teleconferencing

Teleconferencing tools such as Zoom allow the collaborative conducting of online meetings and also online teaching and supervision sessions including online lectures and eTutorials. Zoom is a widely used and easy to use teleconferencing tool which can support up to 300 participants in standard meetings or more participants via online webinars. Zoom can be accessed via desktop or laptop computers or via a mobile device and sessions can be recorded, locally or to the cloud, and shared with students including within LMS course materials.

Zoom teleconferencing can be used to host lectures or conduct one on one or group research supervision sessions and also to conduct eTutorials, which are a valuable form of synchronous online learning and typically include up to 25 students. Zoom teaching and learning features include.

- Screen sharing including slide presentations
- Chats, which allows questions and information to be posted and responded to.
- Breakout rooms, which allow small group activities.
- Polling, which allows surveys and quizzes.
- Muting attendees microphones to eliminate background noises.
- Virtual hand raising for attendees to ask questions.

6.6 Simulation

Simulation is an educational technique that consists of creating a virtual version of a real-life behaviour such as interactions between health practitioners and clients via the use of recordings of actors performing scripts. This technique is becoming increasingly widely used (Lateef 2010; Aebersold 2018) and offers important benefits for online education, as well as for non-online education, and for non-clinical as well as clinical courses. Technological advances including in ease of recording and in the use of Virtual Reality are allowing the increased use of this teaching technique which is well suited to online education and which is improving the equivalence of online education with traditional education in areas which remain challenging to provide equivalence, including courses with clinical or other interactive content. As well as extending the range of online education use of the simulation technique has advantages over other techniques including the practical and ethical advantages of not requiring students to interact with real people. Simulation can replace and amplify real experiences with guided, often 'immersive' experiences that simulate aspects of the real world in a fully interactive and protected environment. The technique can be used to provide structured and dynamic course content that will engage students and help them develop professional skills and understanding in an increasing range of disciplines, without exposing clients to any risks.

6.7 Artificial Intelligence

In recent years, the most revolutionary evolution in teaching and learning methodologies has been the integration of Artificial Intelligence (AI) features including voice recognition and predictive analytics engines that have enabled the creation of virtual assistants facilitating the enhanced learning experience (Roll and Wylie 2016). In this regard, Apple's Siri is the most common and widely used AI feature globally. These virtual assistants not only recognise voice commands and respond accordingly but are also able to convert speech to text, making writing or notes-taking easier. In an educational context, building on the success of the first virtual teaching assistant for an AI course at Georgia Tech called 'Jill Watson', the application of AI has been consistently increasing in the field of education. For example, Georgia State University uses an AI chatbot to respond to questions about enrolment and financial aid. When the system is less than 95% confident of an answer, the query is passed on to a staff member. Similarly, Deakin University has created a platform called 'Genie' that acts as an intelligent virtual assistant that provides students with general advice. Virtual assistants have consistently helped ease the student support burden on the academic and professional staff helping them optimise their time.

6.8 Reflections and Recommendations

In the last decade, there has been an increase in the literature describing the creation, implementation and adoption of various educational tools in teaching and learning with the emphasis on the role of content design and structure in enhancing learning experience as well as improving students' outcomes. Research has consistently shown that quality innovative virtual environments facilitate learners' engagement and enhance learning opportunities. Carefully designed, student-centric technological innovations provide opportunities for learners to imagine and recreate application of skills and knowledge in their specific disciplines in creative ways, and more importantly in retaining new concepts in an interactive and engaging manner.

In the last decade, educational learning systems have continued to evolve incorporating numerous functionalities and features. These technological innovations have changed the digital landscape of online learning and teaching. This chapter has focused on some of the innovations and explores how traditional classrooms and roles are being transformed and how learners engage in different digital spaces to manage and enhance their learning. As we enter the third decade of the twenty-first century, online education space will continue to grow with more innovative educational technologies, catering to further growth in online education. To support this growth, the learning analytics space will need to be strengthened to drive the way that online education programs are delivered, evaluated and improved. For a relatively small investment of online education time and resources, the incorporation of technology advances in new and existing online courses can provide substantial education investment returns, including engaging, dynamic and educationally powerful learning environments.

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Chapter 7
Developing, Maintaining and Using Active Learning Resources for Online Learning and Teaching

Noel Rutter

Abstract The DoITPoMS (Dissemination of IT for the promotion of Materials Science) project was set up in 2000, as a joint venture involving the Department of Materials Science and Metallurgy at the University of Cambridge, and a number of other UK partner institutions. Over two decades, the project has developed open online educational resources in Materials Science and promoted their use. These resources include background information, digital video clips and photomicrographs, but the primary resource is a library of teaching and learning packages (TLPs), which are generally interactive and seek to make maximum use of the online medium to provide richer content than would be possible in traditional printed resources, which were the standard at the outset of the project. In addition to describing development of these resources, this chapter assesses how changes in technology and use patterns over 20 years have had an impact on their sustainability.

7.1 Introduction

Aspects of active learning material resources that help to support and facilitate active learning include the following:

- Simulations of experiments, where the results depend on user input (i.e. the user sets up a set of parameters and by varying those, they can see the effects simulated in real time).
- Games and online questions (e.g. drag and drop) that challenge the user's understanding of the content which is being covered in order to judge their progress.
- Many of the tutorials have users click through concepts step-by-step allowing them to set the pace and easily revisit specific aspects.

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- Content includes subject content relating to the atomic scale of materials, which rely on learners being able to accurately visualise three-dimensional structures. By incorporating rotatable animated models, the tutorials allow learners to interact with and control such structures, making them more accessible than other representations.

The initial resources were compiled as part of a collaborative effort amongst a group of UK universities and they are now actively maintained, updated and enhanced as part of an annual summer school in Cambridge. While the original audience was predominantly the UK academic community, the resources are more generally relevant and are now heavily used around the world. DoITPoMS has sought to enhance its global accessibility via collaboration with international partners with efforts including translation of TLPs into a variety of languages.

The website via which these resources are accessed (www.doitpoms.ac.uk) attracts around half a million users each year. All resources are freely available without subscription and most are available for sharing and adaptation under appropriate creative commons licenses.

This chapter will explore and explain the development and use of these online resources over two decades, not just describing what has worked smoothly but also seeking to highlight potential pitfalls and barriers.

7.2 Background

The DoITPoMS (Dissemination of IT for the Promotion of Materials Science) project was set up in 2000, as a joint venture involving the Department of Materials Science and Metallurgy at the University of Cambridge alongside a number of other UK partner institutions. Over two decades, the project has developed online learning and teaching resources in Materials Science and promoted their widespread use via the website www.doitpoms.ac.uk.

While the resources were not designed with support of online courses as the primary aim, they are very suitable for such use and are also widely used to support active learning in traditional face-to-face courses as part of a blended approach.

There are a number of key principles of the resources:

- They are open and freely accessible to all, for the general benefit of the academic community.
- They are aimed both at learners and educators.
- Content is bite-sized. Those delivering courses and teaching the subject are welcome (and indeed encouraged) to reuse and adapt resources to suit different purposes.
- The resources should take maximal advantage of the medium via which they are accessed, rather than simply transferring traditional teaching and learning resources to an online environment.

7.3 Resources

7.3.1 The Micrograph Library

This is a library of images which are of significant importance in the subject of Materials Science, highlighting the structure of a wide range of materials at a microscopic scale. The library was developed early in the project and has been in a stable form since. New micrographs are occasionally added, but activity in this area is no longer a major focus of the project. The library is described in detail by Barber et al. (2007).

A key aspect of the micrograph library that enables use as a significant learning resource is the existence of significant metadata which details crucial information such as sample composition and processing methods along with details on preparation and microscopy techniques. As a teaching resource, the micrograph library is also invaluable. It is of great use when preparing slides and notes for a conventional lecture delivery and has also been used as the basis for formative assessment exercises. It is the existence of metadata and the searchable nature of this data that is the aspect which takes the most advantage of the online format.

7.3.2 The Video Library

The video library was launched later in the project, at the end of 2007. Videos are organised into several categories, a significant one being experimental procedures. Figure 7.1 illustrates one such resource, part of a series demonstrating mechanical properties of copper. Such videos were not intended to replace the real experiment, but can be useful in a number of scenarios;

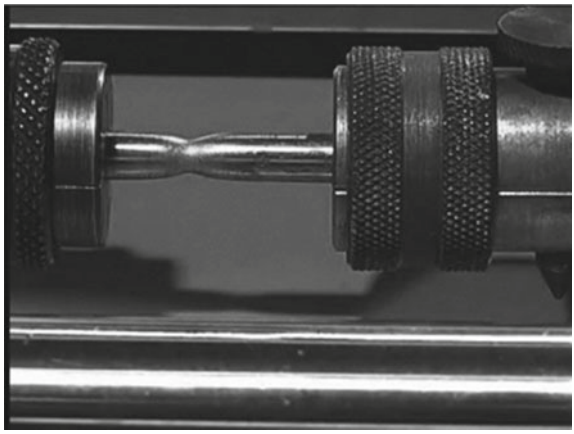

Fig. 7.1 Frame of video showing copper necking in a tensile test (Matthams 2006)

- where the experimental equipment is simply not available, or it is impractical to carry out at the appropriate time (for example in courses which are delivered online),
- as a prior demonstration of an experimental technique that is to be performed, or as a reminder of an experiment that has been performed,
- to observe additional information to what can be seen live, especially via review at slower speeds (Video 35 2006; Video 91 2006).

Several resources in the video library are actually computer-generated three-dimensional views of atomic-scale structures, converted to Quicktime-accessible format. Rather than being 'videos' in the conventional sense of a linear playback, these are interactive resources which can be manipulated by the user. By rotating views of such structures, it is often possible for the user to acquire an appreciation of the structure and symmetry which may not be apparent from two-dimensional pictures. This level of interaction is an aspect which is the key to promoting active learning.

7.3.3 Teaching and Learning Packages (TLPs)

These packages are self-contained tutorials covering a broad range of topics, and which are of key importance in Materials Science. At the time of writing, there are a total of 74 packages published on the main site and around 10 more are in development. The TLPs have a consistent format and are generally presented over 8–10 pages in web format. While they do include basic aspects such as text, mathematical equations and static images, these do not make full use of the digital medium so are used sparingly. The key parts of these TLPs are more dynamic and interactive, taking a number of forms:

Click-through tutorials: Here the learner is presented with a small amount of information at a time and undertakes some action (such as a mouse click) in order to proceed. Generally, animated images proceed in step with text describing what is occurring. A single frame of such an animation, which makes good use of Adobe's Flash format, is taken from a step-by-step guide to sand-casting and is shown in Fig. 7.2.

Mouse-over content: Another style of interactive animation using Flash allows the learner to control the flow of information using mouse roll-over, rather than enforcing a linear approach. Figure 7.3 shows an animation from a TLP covering electron microscopy, in which the user can highlight various parts of the microscope to find out what they do and can click parts in order to investigate further.

Simulations: The potential of the digital medium is more fully realised when the content is generated in response to the user input, and a number of interactive simulations have been developed, such as that shown in Fig. 7.4. Here the learner investigates the stresses in a beam while varying a range of parameters. As well as

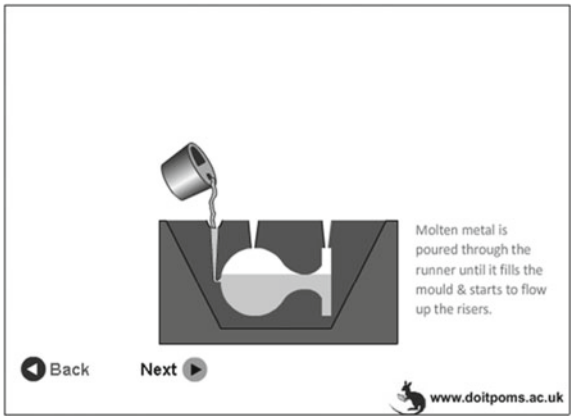

Fig. 7.2 Frame from a click-through animated demonstration of sand-casting (Chapman and Rutter 2007)

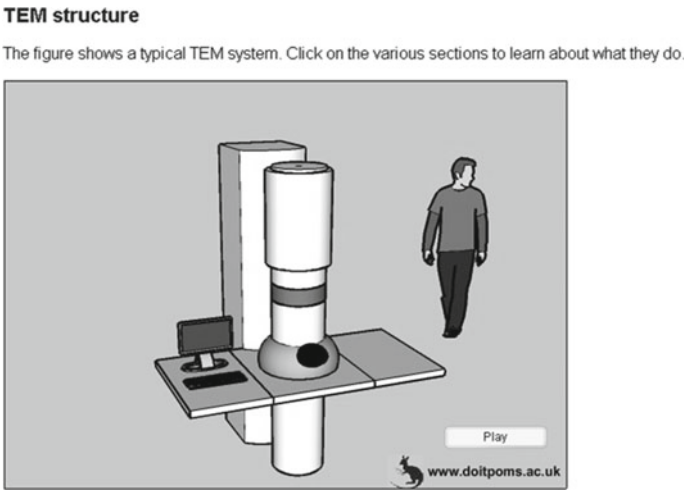

Fig. 7.3 Frame from a roll-over tutorial within TEM package (Chivall and Goodhew 2007)

illustrating the resulting deformation of the beam, the values of important parameters are represented graphically in real time.

Interactive Tools: The packages also contain tools that can be used to support mathematical problem solving via graphical methods, this being a very effective learning technique. One example, shown in Fig. 7.5, is an interactive Mohr's circle where the user enters data and can then investigate (both graphically and mathematically) how the stresses vary as the reference axes are rotated. Other useful tools within the various libraries include an interactive Ellingham diagram, which can be constructed for a wide range of metallic elements and a Lattice Plane illustrator,

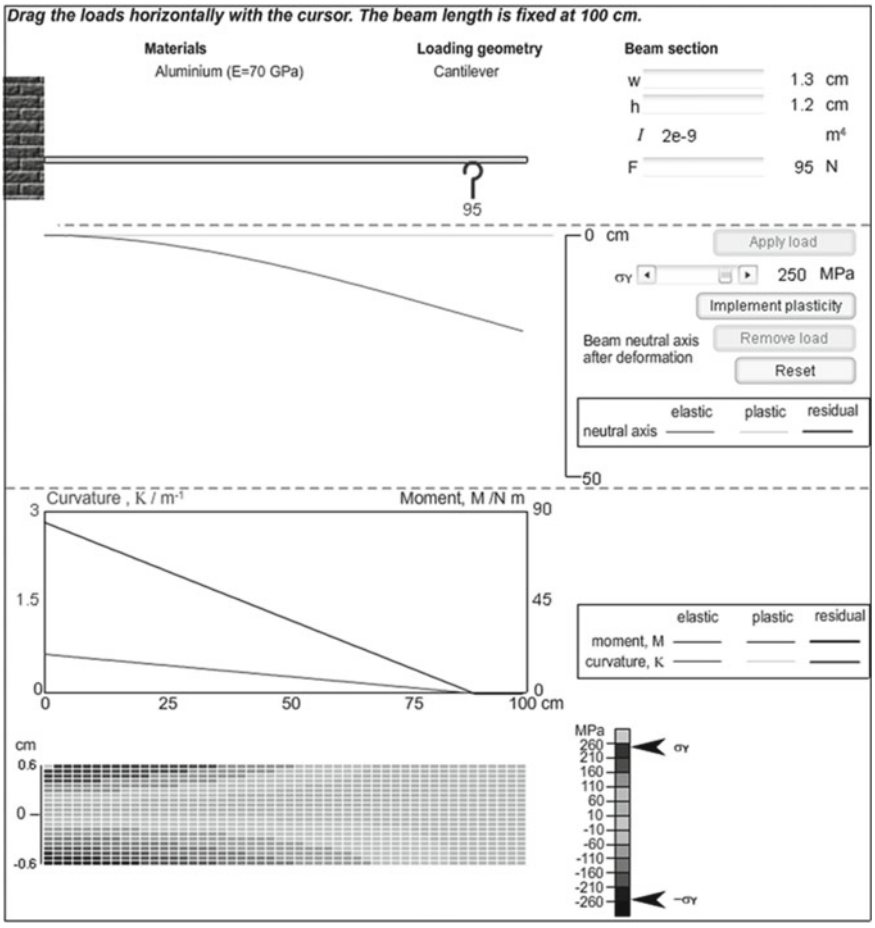

Fig. 7.4 An interactive simulation from the 'Bending and Torsion of Beams' TLP (Pemberton and Clyne 2008)

which sketches the orientation of a lattice plane when the user inputs a set of Miller Indices.

Games: A further interactive use of the Flash platform is to produce games which enhance learning. These can be very simple, perhaps in the form of 'drag and drop' type challenges such as that illustrated in Fig. 7.6, and while such questions and games can be posed using other formats, the advantage here is that the program can produce an arbitrarily large range of problems and solutions at random.

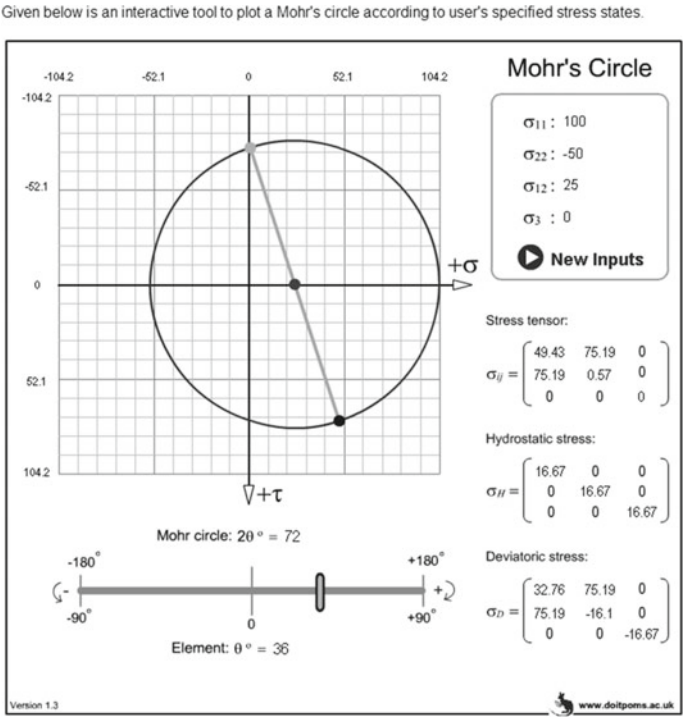

Fig. 7.5 Interactive tool which allows a user to set up and manipulate a Mohr's circle (Sharp and Knowles 2008)

7.4 Resource Development and Usage

7.4.1 Development

In the initial stages of the project, 3 years of funding enabled a full-time employee to manage the project and set up the web delivery platform. There were academic partners involved from across the UK including the University of Manchester, Oxford Brookes University, University of Sheffield, London Metropolitan University and the University of Leeds, and later packages were developed in collaboration with academics based at the University of Liverpool, University of Sheffield and Imperial College, London. Since those early stages, development of new DoITPoMS resources has almost exclusively been via a series of annual summer school held in Cambridge, more information on which was published as in-depth case-study (Taylor and Mannis 2008). Such summer schools have largely focussed on development of new Teaching & Learning Packages.

DoITPoMS worked closely with a project known as 'CORE Materials' (http://core.materials.ac.uk/) which aimed to set up a repository for online resources in the

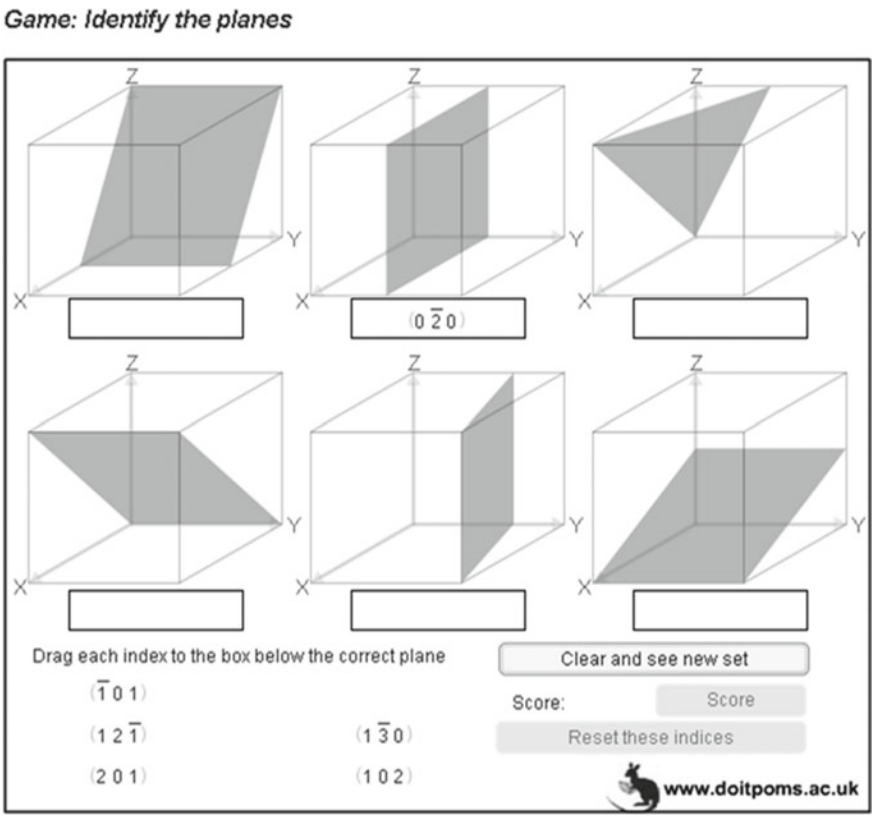

Fig. 7.6 A drag-and-drop game in the 'Lattice Planes and Miller Indices' TLP (Marchment and Rutter 2006)

Materials area. This project gathered a lot of resources, and still exists as a static snapshot of the DoITPoMS resources as they existed in 2009, but the project which was led and funded by the UK Centre for Materials Education (UKCME) came to an end when those subject centres ceased to exist.

7.4.2 Overall Usage

The DoITPoMS resources are widely accessed, and Google Analytics has been used to track this over the last 8 years. In that time, there have been around 4 million users, accessing around 20 million pages (Fig. 7.8), which is remarkably high given that the academic discipline of Materials Science is comparatively small and specialised. Usage reflects the academic calendar with a broad annual dip in the (northern hemisphere) summer, and a sharp dip over the end-of year holiday period. The general

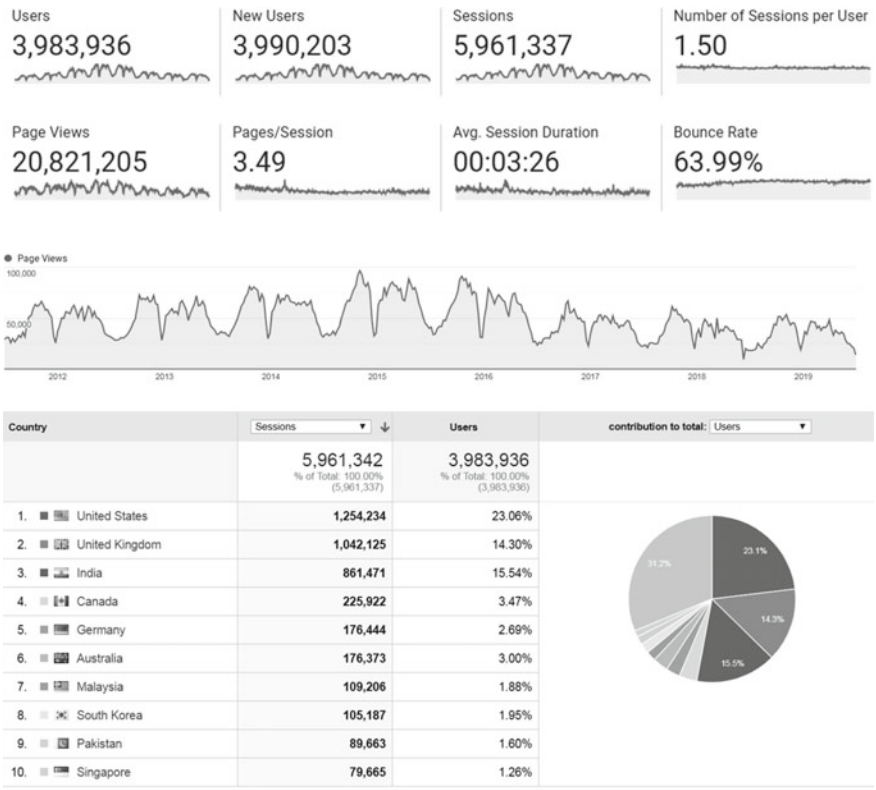

Fig. 7.8 Site access statistics from Google Analytics June 2011–June 2019. (Top) overall summary; (Middle) detail of weekly page views; (Bottom) Geographical detail (table ranking is by number of sessions, pie chart shows number of users)

trend showed significant growth between 2011 and 2015, with weekly pageviews reaching as high as around 100,000 during the busiest periods, but there has been significant decline in usage since, possible reasons for which are addressed later in this chapter.

Geographically, usage is unsurprisingly concentrated in countries in which English is most widely spoken and which have large higher-education sectors. For comparison, access from China ranks 25th on the country list, though in terms of the language settings of users, Chinese is the second most common language (behind English but ahead of Spanish, French, German, Portuguese and Korean) indicating that there is significant access by Chinese language users who are based outside China.

7.4.3 Use in Active Learning

The Teaching and Learning Packages are the primary set of resources and these have always been envisaged as supporting active learning. They are frequently used in an informal way, by students worldwide who find or are pointed towards the resources and use them independently to supplement their learning of particular topics, but they can also be used by educators and embedded into taught courses with active learning in mind. This subject was discussed at a workshop at which participants highlighted how such resources could be used to promote active learning (Rutter et al. 2008). Aspects which particularly help to support and facilitate active learning include the following:

- Simulations of experiments, where the results depend on user input (i.e. the user sets up a set of parameters and by varying those, they can see the effects simulated in real time).
- Games and in-line questions (e.g. drag and drop) which challenge the user's understanding of the content which is being covered in order to judge their progress.
- Many of the tutorials have users click through concepts step-by-step allowing them to set the pace and easily revisit specific aspects.
- A number of aspects of the subject relating to the atomic-scale of materials rely on being able to accurately visualise three-dimensional structures. By incorporating rotatable animated models, the tutorials allow the user to interact with and control such structures, making them more accessible than other representations. A key to active learning is for the user/learner to get feedback when they interact and make changes.

Specific examples of use of the resources for active learning are:

- Linking interactive packages to tutorial questions, which is a significant focus at the University of Cambridge,
- As preparation for practical work, so that there is more time available for the active experimental work during laboratory sessions,
- As part of flipped courses at Monash University, where pre-class preparation often involves use of a teaching and learning package.

7.5 Reflections and Recommendations

7.5.1 Technology

A major advantage of developing resources for online dissemination is the potential for scale and efficiency—that they can be used to deliver courses not just for large numbers of students but potentially over a number of years. However, the issue of longevity can be challenging for resources such as those described here. Unlike

traditional learning resources such as books, digital content can be rendered inaccessible by the development of new technologies (a forerunner set of e-resources in Materials Science known as MATTER were initially delivered via CD-ROM!). Another challenge is the rapid progress in digital technology, which can result in such resources looking and feeling outdated within just a few years. Since the invention of the printing press in around 1450, followed by the ability to print in colour and to print images shortly afterwards, relatively little changed in that medium for half a millennium, other than gradual reductions of cost and marginal improvements in quality. Digital technology on the other hand has made rapid transformational progress within just a couple of decades with aspects we now take for granted such as high-quality streaming video being non-existent at the start of this century.

Specific challenges in this area we have faced during the project include:

The selection of Adobe Flash as the medium for development of interactive elements of TLPs has proved unstable and problematic in the long term. There were various good reasons to use Flash early in the project as it enabled high-quality resources to be developed, was fairly easy for developers to learn how to implement, and Flash Player was freely and widely available for end-users to view and use the output. It was the dominant format for developing this type of content up to around 2010, but more recently as browsers have preferred open web standards over commercial plugins, Adobe Flash Player has become less widely supported, and in 2017 Adobe announced that they would end its distribution in 2020.

The response to this emerging threat to many of the key DoITPoMS resources was to undertake conversion to HTML5. However, this is a painstaking and costly exercise, with no guarantee that all functionality will necessarily be retained. The clear lesson here is to be careful about being overly dependent on commercial software packages and to make the use of open standards wherever possible.

The emergence of smartphones and tablets as devices from which users would access web-based resources was not foreseeable at the start of the project two decades ago, and when browsing via phones and tablets did begin to emerge, the extent to which this would become so prevalent was overlooked. With hindsight, more might have been done at an earlier stage to ensure compatibility with such devices. The challenges that have arisen include the fact that resources may not display in a suitable way on smaller screens, screen controls might not be easy to interact with at the sizes they will render on a phone and with touch rather than mouse interaction and furthermore that some resources might not be able to be displayed on such platforms (this has been primarily associated with Flash issues detailed above). We did track access to the site via phones and tablets at the appropriate time and observed that this was a low proportion. However, we were probably wrong to reach the conclusion that this meant that it did not really matter—a better conclusion might have been that it was so low because of how dysfunctional the user experience was and that this should therefore have been a higher priority. The lesson here is not that designing resources for phones should have existed from the start, but rather that we should have been faster to try to adapt old resources and had better plans for how to design new content flexibly for new hardware, rather than ignoring the issue.

Behind-the-scenes aspects of hosting and maintaining the resources have become more of a challenge. In particular, security concerns have recently emerged, linked to the way in which the website is designed. Vulnerabilities that were not thought significant or serious in the early days of the web are now a major problem, and can only really be addressed with significant professional resource input. This has recently become so severe that there was a significant possibility in recent months that the webserver would simply be turned off due to such concerns, rendering the resources completely unavailable. Such issues should clearly be considered when deciding how resources will be hosted, how sites will be designed and who will be responsible for maintaining secure access into the future.

7.5.2 Funding

A significant issue for sustainable development and availability of online resources such as those developed in this project is the existence of a stable long-term funding model. It is not sufficient simply to ensure that funding is available and earmarked for initial development and implementation, but that there is a strategy in place to fund ongoing development, updating and maintenance over a longer period. There are many examples of excellent projects which did valuable work producing online content for a period of 5–10 years, but then through lack of ongoing funding simply fell dormant or in some cases ceased to be available. This lack of long-term stability often leads to significant loss or underutilisation of resources into which much time and money have been invested.

A long-term funding model is likely to be easier when developing resources which will be used directly as part of online taught courses with associated student fee income, as there is effectively a direct paying customer and an ongoing revenue stream. For a more open model such as the DoITPoMS project uses, this was simply not an option and funds have had to be found from a wide variety of indirect sources. Funding was originally via a direct grant from the Higher Education Funding Council for England (HEFCE), then for several years via UKCME on the basis that the resources supported the whole UK Materials community. Since that time, there has been sporadic small grant funding, but the continuing existence of the project is due to significant financial contributions from the Department of Materials Science and Metallurgy in the University of Cambridge, which is justified on the basis that the Cambridge course benefits significantly from the resources. However, the levels of funding available via such a mechanism will only ever be sufficient to enable basic maintenance and minimal development.

In 2011, several of the opportunities and threats described here were identified at the time they were emerging (including movement away from Flash, adaptation to mobile platforms and the possible benefit of language translation) and a funding bid was made to the Higher Education Academy with a plan to address these issues. However, the bid was unsuccessful, with the result that these things were not adequately addressed at the appropriate time.

A great benefit of the resources being freely available for the whole world is maximising overall benefit and impact, but the downside is that the free-rider problem exists. Lots of universities and other institutions make significant use of the resources, but there is no obvious mechanism for the community of users to make a financial contribution to ongoing development. Options such as user subscription and advertising have been considered, but these are somewhat at odds with the philosophy of the resources, and would create additional demands without necessarily generating significant revenue.

7.5.3 Resources and Users

An ongoing challenge has been quality control of resources in the repository, given that a wide range of people are involved in their development. One aspect is the decision as to whether new content should be added or whether it is more appropriate to wait for further development and improvement. This can be tricky when resources remain unpublished despite significant effort having been put into create them but is not usually too difficult to define and impose a standard as to whether resources meet current expectations. What is more difficult to decide and action is whether resources developed and published on the site many years ago still meet appropriate standards and expectations. Removal of such material is more controversial as it would effectively become unpublished (although due to other archiving repositories such as CORE materials, they would continue to exist). The ideal solution would be having the means to provide ongoing update and improvement of all resources that are felt to need such work. In practice, relatively few resources have been removed, but this means that there are some packages on the site which do not meet the same standards as would be expected of contemporary material.

Although the resources were initially developed collaboratively and that remains the aim, Cambridge has been almost the sole contributor for the last 15 years, and the site has a clear University of Cambridge branding. This is beneficial from the point of view of quality assurance and has generally been done in a sufficiently subtle way as to not be overwhelming or off-putting. Essentially, the website has strong Cambridge branding but the resources themselves carry only the DoITPoMS brand. This is very important for portability as there are often significant barriers to use of a resource by institution X if it is clearly developed and branded by institution Y. Being associated with a brand which represents a shared and open set of resources, makes it much more likely they will be used and embedded by other educators. This goes both ways and if the intention is that resources are to be exclusive and non-shareable, then clear institutional branding becomes favourable.

Issues surrounding ownership rights and copyright have been carefully considered since the start of the project and in general have not posed problems. The initial decision was that the site would not include any material which had been developed outside the project (and might therefore be subject to some copyright ownership) unless absolutely necessary. Hence almost all material on the site was developed

directly for the project and is not subject to copyright. In around 2010, significant work was done to clarify ownership and shareability rights, the outcome being that almost all resources now carry a Creative Commons license, usually with the designation 'by-nc-sa', meaning that those reproducing the work must acknowledge the source (by), are limited to non-commercial use (nc) and if they modify the content should make the resulting product available on the same terms (sa—share-alike).

As an open resource accessed by many thousands of users, regular communications are received. Some of these are requests for academic support or further information, which can generally be dealt with by a simple standard response that this is not possible due to the nature of the project. Sometimes, however, errors, inconsistencies or unclear aspects are identified by users, which is very valuable, and hence having a mechanism for receiving such feedback has been useful.

In 2010–11, a small project was undertaken to translate a limited set of resources into other languages—in this case Spanish and Mandarin versions of one TLP. This was not too difficult to achieve, but it has been difficult to assess whether it is something worth doing more widely. There would need to be a critical mass of resources available in a given language to make the resource set become a significant resource for that user group. Translation was generally felt to be a positive thing that would be worth doing, but it has never been a priority given the limited funding available. The path to doing this more widely would be to engage with international partners who would be interested in doing the translation for the benefit of their own language-group academic communities.

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Chapter 8
From Virtual to Reality—A Practical Guide to Creating Educational Virtual Reality Content

Tony Mowbray

Abstract Virtual reality (VR) technology is being used increasingly in educational institutions with the use of VR set to grow in the education sector by around 59% between 2018 and 2022 (Technavio in Global virtual reality market in education sector 2018–2022, 2018). The motivation behind why educators are progressively adopting this technology comes from the potential pedagogical benefits. VR provides a promising platform to help facilitate a constructivist learning approach and student collaboration, along with offering the possibility of increased student engagement, immersion, enjoyment, and a deeper learning experience (Kavanagh, Luxton-Reilly, Wuensche, & Plimmer in Themes Sci Technol Educ, 10(2):85–119, 2017). However, according to the technology adoption lifecycle, this technology has not yet reached mainstream adoption despite its increasing use (Telsyte in Video games driving Australian VR headset sales, 2019). This creates barriers to educators in the online space as most students do not currently have access to the hardware necessary to run educational content created for this medium. Furthermore, the range of hardware and software currently available to create these experiences can be daunting for educators wishing to explore this space. This chapter serves as a practical 'how to' guide for those educators wishing to incorporate this technology into their curriculum.

8.1 Introduction

Some questions that this chapter will answer for educators wishing to use this technology are: what are the differences between virtual reality, augmented reality and mixed reality? And for what educational purposes is each medium best suited? How can these experiences be made available to online students? What are some potential drawbacks of VR that educators need to account for (e.g. VR motion sickness and environmental hazards while using this technology)? What hardware and software are currently available to create educational content in this medium, and what are the strengths and limitations of each? Taking this last question as an example, educators

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currently have a choice of software to enable them to create educational experiences in this medium. Game engines (e.g. Unity) offer a great degree of freedom for creativity in crafting tailored educational experiences but often have a steep learning curve and require some level of programming knowledge. More intuitive drag-and-drop software makes it much easier and faster for educators to create educational VR software but this comes at the cost of greater creative restrictions, ongoing paid subscriptions and external hosting of content. Another alternative is the creation of 360° VR capable video through the use of a 360° camera that requires no programming knowledge, no ongoing costs, or external hosting. However, 360° video VR experiences are the most restrictive in terms of the level of interactivity and types of content that can be created when compared with software development options.

With respect to hardware, tethered headsets currently offer the most graphically impressive experiences but are also the most costly. Stand-alone headsets are significantly cheaper and easier to operate, but are often less powerful than their tethered counterparts. Smartphone VR headsets that use a smartphone as both the screen and computer are currently the most accessible way of offering VR experiences given smartphone VR headsets start from around $5 and 88% of Australians owned a smartphone as of 2017 (Drumm, White, Swiegers, & Davey, 2017). However, smartphone VR headsets also offer the most basic VR experience out of all of the headsets available and come with their own limitations. These limitations include possible interruptions via incoming calls, texts and notifications, and the significant strain VR content often places on a smartphone can result in a lagging experience. This brief but comprehensive guide will be a valuable resource educators can use to gain an overview of this emerging space and a companion to refer to when designing their own educational VR content.

Let's begin our journey into Virtual Technology (VT) by taking ourselves back to 1981. This was the year when one of the first IBM personal computers (which coined the term PC) was released to the public, the IBM 5150. Imagine you are looking for a new and cutting-edge way to produce and manage your documents. You find yourself with a cool $4500 Australian to spare (the equivalent to around $12000 today). You purchase and set up your new IBM 5150, turn on your 11.5-in. monochrome screen, and boot up the device. Within a few minutes you hear a BEEP followed by a few flashing LEDs which lets you know everything is running as it should. The screen is blank except for the following green text showing in the top left-hand corner:

You insert the 5¼ in. diskette containing your word processing software and open your technical user's manual that accompanies your machine to find the correct keyboard commands to run it. After some keystrokes and a little more patience, success! The software is up and running, and you can now begin putting together your document. Bearing in mind it is a bare-bones experience without any option for fonts, colours, headings, layout, etc., and if you want to print your creations, investing another $700 on a printer will give you that option.

More than 30 years on and it is no secret that technology has come a long way. Our mobile phones alone are many times more capable than some of the most powerful computers of that time, and come at a significantly lower cost. The amount of choice we have as consumers has also grown exponentially alongside these technological developments. VTs are no exception to these same trends. Since VTs started to become more commercially viable in the first quarter of this century the number of devices available has increased, the technology has improved, and prices have fallen.

While in many respects, this is a good thing, the rapid pace of development and increasing amount of choice can often be overwhelming. What's more, having an understanding of the technology and its capabilities is by itself not enough to develop quality educational content using this medium. This brief but comprehensive guide is designed to be a valuable resource for educators wishing to gain an overview of this emerging space and a companion to refer back to when designing educational content. It is presented in a way to step you through each stage of designing an educational experience using VTs, from contemplation to dissemination. Whether you are new to this technology or already have knowledge in this area, this guide will help you structure your approach and get you thinking about the questions you need to ask when designing your educational content.

8.2 Defining Virtual Technologies

First, before we get underway with designing our content, it is important to define the technologies that are included under the term virtual technologies. The technology we will look at has many variations and definitions that are not always agreed upon by the big tech companies. Therefore, the definitions below can be thought of as umbrella terms that cover broad categories of technology which can come in a variety of combinations and forms.

8.2.1 Virtual Reality (VR)

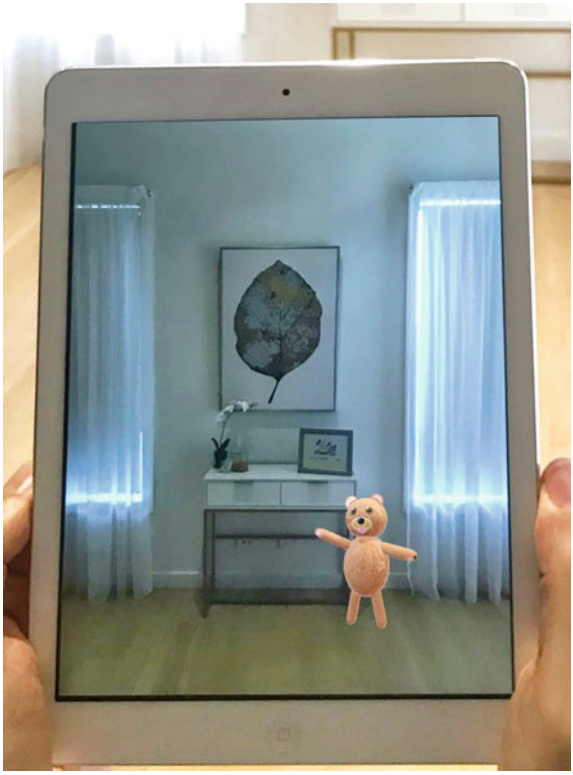
This can be defined as a computer-generated environment that is delivered to the user in a way that is designed to suspend reality through immersing the senses in this environment. In other words, VR hacks into the senses by blocking out the real world and immersing the user in a simulated one. A VR headset is a helmet-like device called a Head Mounted Display (HMD) that covers the eyes. Visuals are shown to the user via screens inside the HMD and sensors track the movement of the head, so that moving your head produces the same movement in the artificial environment. This enables you to look around the virtual world in the same way you would in the real world. Additional hardware like headphones, sensors that track movement of the body and tactile feedback devices can all be incorporated to increase the realism and immersion of the experience.

Examples (see the images in second and third column Table 8.1): A HMD with headphones, sensors, and hand controllers. The headset pictured in the second column requires a connection to a computer, whilst the HMD in the third column does not require a computer connection. The users head and hand movements are tracked, and moving around within a virtual environment is only constrained by the size of the room, sensor range, and cable length. The HMD in the third column has inbuilt movement sensors and no cable, so it is not restricted by sensor range or cable length like the HMD pictured in the second column. This particular headset also has hand tracking. The inbuilt sensors can track and recreate the movement of your hands in VR without the need for the controllers pictured!

How can I experience this now? If your educational institution has no headsets available to try, similar hardware to the example above are commercially available and can be purchased with prices varying. Cheaper options might include sampling a VR headset demonstration at a store or kiosk, and there are also companies offering the opportunity to have a VR experience for a considerably smaller fee than purchasing the equipment. Finally, if you own a smartphone, you could have a limited VR experience by using your smartphone with a basic HMD for under ten dollars or even make your own headset for free out of cardboard using one of the many templates found on the internet.

8.2.2 Augmented Reality (AR)

Whereas VR attempts to block out the external environment, Augmented Reality uses the environment by overlaying digital content over a live feed of the external environment being viewed through a device. Typically, you might use the camera on a smartphone or tablet to view the environment on-screen, and software will then superimpose multimedia like images or text onto the world we see via the camera. While you can see VR as trying to replace the reality you are in, AR works by adding to the reality you are seeing rather than replacing it.



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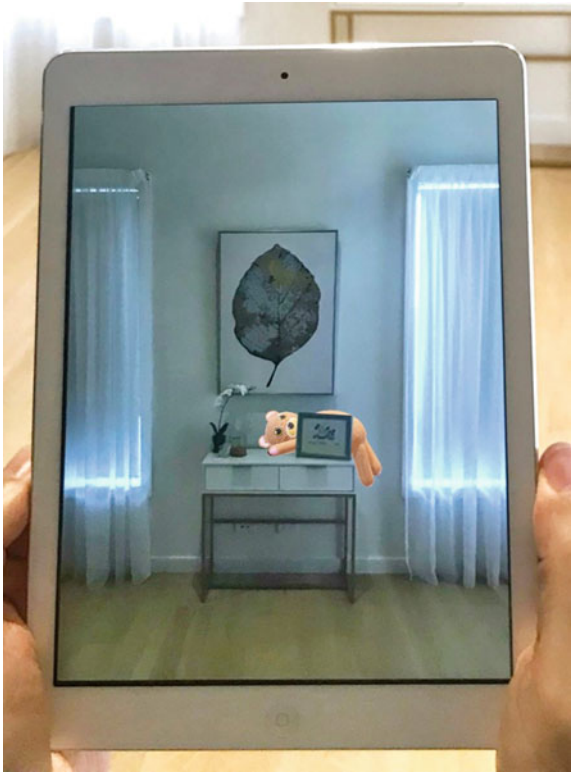
Examples (see Table 8.2): A digital character or object seems to appear in the real world when viewed through a device. The image above shows a teddy bear superimposed onto a live video stream of a real environment.

How can I experience this now? It is possible to experience AR using smartphones, tablets, laptops, games consoles, certain HMDs and other types of computers with a camera. Doing an internet search of augmented reality apps will reveal an abundance of AR software available for different platforms to try.

8.2.3 Mixed Reality (MR)

This also goes by the name hybrid reality or extended reality and is similar to AR in that it overlays digital content onto a real-world environment with the difference being how that content interacts with the environment. MR can be thought of as a more sophisticated form of AR. Unlike AR, the software maps the physical real-world environment and aligns the digital content with these physical elements so that the digital content can interact with it



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Examples (see Table 8.2): A digital character or object seems to appear in the real world when viewed through a mixed reality capable HMD but unlike AR, this character or object can interact with the environment by, for example, being able to hide behind a real object as shown in the image above.

How can I experience this now? You may find MR more difficult to come by than AR due to the greater complexity behind creating MR experiences. However, you may be able to find experiences using the same devices you would use for AR, and similar to VR, you can see if your educational institution or certain stores have a device to try, or purchase your own mixed reality capable HMD.

8.3 Contemplation Phase: Asking Why?

When you contemplate using one of the above technologies for your educational content, one of the first questions you need to ask yourself is why? Have you ever purchased something only to regret buying it soon after? Most of us can relate to the feeling of buyer's remorse when that item we *think* we need at the time turns out later to be something we could have gone without. In the same way, we need to make

sure we are creating a virtual experience because it serves the educational content and not just because it is the latest thing.

To help us do this, we have to have an appreciation of how VTs are best used. While the impact of this technology on educational outcomes needs to be explored further, we can get some idea of the educational strengths of this tech through what educators are currently using it for. Kavanagh, Luxton-Reilly, Wuensche, and Plimmer (2017) analysed educator motivations behind using VR across 99 articles which used VR to deliver educational content. They found educators were using this technology for a range of purposes, with some of the main ones summarised below:

8.3.1 Gamification

This refers to applying elements you would find in video games to an educational context. Let's take the classic video game Super Mario Bros as an example. Presume you are playing this game for the first time and as you turn it on the colourful graphics and pleasant music immediately draw you in. As you play, you find that your character dies, and dies often, given your lack of experience. This is an initial source of mild frustration but also a welcome challenge as the first level is tailored to be quite easy to meet your novice skill level. As you continue playing you become more familiar with the game mechanics and find your character dying less often as a result. Notice, no one has explicitly told you about how to play, but you have found these things out gradually through a process of trial and error. You are learning without necessarily being explicitly aware that you are. Eventually, you make it to the end of the stage and you are rewarded with a small victory animation, music, and access to the next level. The difficulty with each level increases slightly, just enough to make the game challenging for your increasing skill level without making it too difficult so that you give up in frustration. Moreover, you are the master of your own progress, being able to reset the game, replay a stage or load from a saved point whenever you wish. This means you can practice as much as you like to master a skill or a particular level until you are ready to move on. On the whole, you find your game of Super Mario Bros is an enjoyable and entertaining experience.

Educators are seeking to capture these same elements in education through using VTs. Take for example a heart surgeon, a highly specialised job with a very real risk to patients. Learning on the job would carry unacceptable risk, with one mistake potentially causing significant harm or costing a life. Furthermore, the equipment and physical space needed to recreate a realistic surgical environment to practice would cost time, money, and resources. Creating software where the user can learn how to conduct surgery enables the student to learn through trial and error without any risk of harm and relatively fewer costs. You could have 'levels' with clear goals (e.g. level 1, prepping for surgery) and the tasks could get increasingly more challenging as each is mastered, but the user could determine how fast, or slow, they progress through each level. Finally, once a level is completed, the user could receive a digital badge as a reward to show their competency in that area. While gamification is not

exclusive to VTs, this technology does have some unique strengths, which may make them more suitable to gamification than other technologies. These strengths will be discussed next.

8.3.2 Realism and Immersion

This is one area where VTs can provide superior performance to other technology. Taking our surgery simulation above, if we were to develop this for VR your students could have a 360° experience of the surgery room. As a student, you could literally turn your head to survey the instruments and team around you, step up to the virtual surgery patient and lean over to get a closer look. Headphones immerse you in the sounds of the surgical room and hand controllers allow you to use your own hands virtually in the simulation. As you pick up the instruments you need and begin to make the first incision, haptics in the hand controllers give you force feedback to make it feel like the real thing.

Having a realistic and immersive experience can be important to learning outcomes for a number of reasons. Perhaps, as in the case of our surgery example, it is important to have a simulation as close to the real thing as possible to facilitate mastery of a skill. For example, using a computer mouse to make the incision would be quite far removed from the actual experience of performing surgery when compared with the realism of using movement sensitive hand controllers with haptic feedback. Realism can be important for any educational situation where you are trying to build 'real-world' skills and to do that you need the simulation environment to mirror the real thing as closely as possible.

Immersion, on the other hand, is going to be particularly important if you have a simulation where it is important for the user to suspend reality, such as if you want the student to experience the reality through the eyes of someone else. One of the authors own projects, for example, explores emotions in the workplace. It is important for the learning outcomes of this project to evoke authentic emotions in the students. To do this, the simulation involves a VR workplace environment where students get to look through the eyes of each of the workers. The ability of VR to create an immersive environment means that when your supervisor in this video simulation confronts you about your inability to meet a deadline, the level of immersion is more likely to bring about an authentic emotional reaction than if watching the same video simulation but on a regular screen. If realism and/or immersion are an important cornerstone to the educational activity you are designing, then using VTs to deliver the content is certainly worth considering.

8.3.3 Active Learning

This involves being engaged in the learning process with students granted some degree of input and interaction with the learning activity. Active learning aligns with a constructivist pedagogical approach that argues that learners construct their own understanding through active participation. This is in contrast to passive learning that requires minimal input, such as watching a video or reading text. VTs lend themselves well to this active learning approach as they allow for a level of interaction that is not possible using a standard computer setup. Thinking back to our surgery simulation example, VTs can take online active learning to another level by making it a rich full-body experience, allowing the user to engage multiple senses to interact with a fully immersive environment. VTs can also align well with a social constructivism approach, which is the process of constructing knowledge through interaction with others. Take for example a MR experience where students see an anatomically accurate heart appear in the environment by looking through a compatible HMD. The students could reach out and manipulate the virtual image of the heart with their hands, with each student able to see each other's manipulations being carried out on the heart in real time. This would allow them to work together in dissection and learning about anatomy. One major advantage to constructivist approaches is that they are thought to provide a deeper level of learning. If the educational activity you are designing is built on a constructivist pedagogical approach then VTs can be particularly effective in delivering this.

8.3.4 Enjoyment and Motivation

These are related in that if students enjoy an activity, it will usually lead to increased motivation to engage. What makes VTs potentially more enjoyable than other technologies? Novelty can be one contributing factor. The experience of being transported into another reality or having digital contents interact with the real world can pique interest and provide an initial drive to engage. This is particularly true if it is the first time a student has ever experienced VTs. However, the initial enjoyment and motivation through novelty can wear off after some time. So, beyond novelty, VTs also provide increased enjoyment and motivation through their strengths of interactivity, immersion, and realism that we explored earlier. Thinking back to our discussion on gamification, one of the reasons people find video games so enjoyable is because they allow us to immerse ourselves in another reality with their high level of interactivity. The sensory richness and sense of presence that these technologies provide works to engage a user's attention to help provide the enjoyable state that gamers describe of 'losing' themselves in a digital world.

Having explored some of the main reasons educators are using VTs for their educational content, reflect on your own reasons for using this technology. How will your content benefit from the strengths related to VTs? Before choosing to use VTs,

consider if other mediums of content delivery such as video or interactive activities could provide similar or better outcomes. If viable alternatives do exist, how do they compare to using VTs in terms of time, money, and resources? Finally, before making the decision to use this technology, make sure to consider the challenges associated with VTs which we will be discussing next and at various points throughout the chapter.

8.4 Challenges to Using Virtual Technologies

As an avid gamer, I enjoy having game-design elements applied to educational content when learning. So, when I introduced a brief weekly quiz into my lecture in the format of the popular TV game show *Who Wants to be a Millionaire*, I was confident that it would be a big hit with my students. That's why it took me by total surprise when one day a student gave the feedback that they found the quiz was actually the *least* favourite part of the lecture. It was an important reminder that just because I find an activity exciting, it does not mean others do too. In this case, the student did not like the quiz as they felt that the gamified content was more of a gimmick that distracted from the educational content. In the same way, not every student will share your enthusiasm for the content you create using VTs, no matter how enjoyable and pedagogically sound you think it is. This could be because they prefer to learn using other methods as VTs are a new, unfamiliar, and uncomfortable way to learn for them. Also consider that setting up these devices can take technical expertise and time which could be a barrier to inexperienced users. On the other hand, having high familiarity with VTs may remove the novelty of the experience and decrease the motivation to engage.

It is also important to keep in mind any restrictions that might stop students from partaking in the learning activity. For example, those sensitive to motion sickness might not be able to use some VT content and if students do not have access to the relevant hardware this could lead to them missing out on the experience altogether. When considering accessibility, we also need to consider the experience for students with different abilities.

In making your content accessible, it is good to provide as many options as possible and provide alternate ways of engaging with the content for those students who do not have the necessary hardware or would otherwise prefer to learn in a different way. Instead of limiting the user to using a VR headset, enable the user to engage with the content on a flat-screen. Does the VR content contain 'bells and whistles' that are not essential to the learning experience? Then consider a mode that enables users to strip the experience down to its fundamental educational components for those wanting a simpler experience. Options to lower the graphical settings of the educational software program will help students with less powerful computers to run the software. Allowing the ability to magnify the visuals and including closed captions will make the experience more accessible to those with vision or hearing difficulties.

When introducing any text into your content, consider giving the user the ability to modify the size, contrast, and even font type of the text. Sticking to more basic fonts like Arial or Calibri is preferable as they are easier to read than more stylised fonts. Consider including the option to change text to the Dyslexie font which is specially designed to assist people with dyslexia. Providing options to move in the virtual space by using a gamepad controller and not needing to perform the actual physical movements will make the experience more accessible to those with mobility issues. Think about including a colour-blind friendly mode that modifies the visuals to make them more palatable to students with colour blindness or if recording a video, using colour-blind friendly colours in the recording. When considering accessibility, thinking about these challenges to accessibility is a start but it is also a good idea to begin a discussion with relevant departments within your institution, such as those involved in disability support or counselling.

8.5 Production Phase: Assessing the Technology Landscape

Once you have thought about the strengths and challenges of VTs in relation to the learning outcomes you wish to achieve and decided that your educational content is appropriate for this medium, the next step is production. At this stage we need to ask ourselves, how can I translate my ideas into a virtual application? As mentioned at the beginning of the chapter, the amount of different hardware and software options available to do this can often be overwhelming. Here we will be taking a broad look at some of the options available and their features to help you choose the best tools for the job.

8.5.1 VR HMDs

These are the first area we will explore. Before we go on, a brief word of warning about VR motion sickness. Just like car sickness, if our eyes are telling our brain we are moving but your body feels like it is not moving, the conflict in cues can make you feel a host of unpleasant symptoms including nausea, dizziness and headaches. Keep this in mind when developing your VR experience. Having a 180°/360° video where the camera moves but the user does not will lead to significant motion sickness in many students. While beyond the scope of this chapter, looking at how to prevent and reduce VR motion sickness (e.g. allowing the user to teleport from one location to another, blocking out peripheral vision when moving) will be vital. There are quite a few options to choose from but they generally fit into one of four main categories.

1. Smartphone HMD: Using a basic (and usually cheap) headset with a compatible smartphone you could experience 180°/360° videos. This is where users are able to experience a video as a moving 180°/360° panorama by simply turning their

head. They are in essence surrounded by the video and as a result, feel more immersed in it compared to watching the same video on a regular screen. If you own a smartphone this can be very cost-effective, but these VR experiences can be quite limited in terms of interactivity and processing power. For example, they only allow for rotational movement which means you can rotate your view by turning your head but your viewpoint is fixed (this type of movement is called three degrees of freedom or 3DoF).

2. VR HMDs (tethered): These are devices specifically designed for VR that are tethered to a computer. The HMD is effectively a set of screens, one for each eye, and a cable (the tether) connected to a computer which provides all of the computational power needed. Unlike smartphones, the computing power for these devices is significantly more powerful allowing for a smoother and graphically more impressive experience. They also come with sensors that allow for movement with six degrees of freedom (6DoF), which means you can move much like you would in the real world and your viewpoint is not fixed. The drawback compared with smartphones is that they can be considerably more costly and difficult to set up.
3. VR HMDs (self-contained): Simply put, these HMDs do not require a connection to a computer unlike their tethered counterparts. This makes it much less expensive to own a headset as you no longer needed to purchase a powerful computer in addition to the headset, and being dedicated VR devices, they offer a far more superior VR experience to using a smartphone. Some iterations of these headsets only offer 3DoF while others provide 6DoF like tethered headsets do. Currently, many of these headsets do not need external sensors to provide 6DoF as they have what is known as inside-out tracking, that is, these movement sensors are now built into the headset itself. Whilst these headsets can be a lot cheaper and easier to use/set up than their tethered counterparts, they also can be significantly less powerful.
4. VR HMDs (mixed): The broad categorisations of tethered and self-contained headsets are not mutually exclusive. Some self-contained headsets now include options to stream content either via a cable or wirelessly from a computer. This blurs the boundaries between the two categories and means users can get the 'best of both worlds' with the option for a self-contained mobile device or a tethered device depending on need and preference. Streaming content from your computer wirelessly to your HMD seems preferable to using a cable but does require good reliable WiFi otherwise the experience will lag or disconnect.

To finish this section of the chapter, I would like to include one final note on using a virtual machine. Currently, if you would like to run a VR experience from a computer, it needs to be a fairly powerful computer which can be costly to set up. However, by using a virtual machine you can get a similar performance to owning a powerful computer without actually buying one. A virtual machine is a service that hosts a powerful computer, usually in a remote location, and allows you to stream content from their computer. It essentially broadcasts a virtual computer to your device so you can have all the benefits of a powerful computer without needing to

actually own one. This of course can come with its own subscription costs and would require a good reliable internet or network connection to stream the content but can offer a cheaper alternative.

Each device has its strengths and drawbacks so a big part of choosing the correct device is deciding what is going to be most important when developing your VR experience. If cost and accessibility is the biggest factor, then a smartphone HMD may be the best option, however, if interactivity is key, then a tethered or stand-alone headset may be preferable. Use the table on the next page to help you decide which device may be best suited for your application.

8.5.2 AR and MR

These will be considered together in this next section. If you recall, MR is more sophisticated than AR in that it maps the physical environment to allow the digital and physical objects to interact. This means that not all devices that are capable of AR will also be capable of MR. However, as mentioned earlier, the line between AR and MR can be a little fuzzy at times and devices may offer varying degrees of MR or both AR and MR in one device, so we will consider these two categories together.

1. Smartphones and Tablets: These are currently used more for AR applications. As we explored earlier, users view their environment through the camera of their device and software introduces digital components to this live feed. Users can also use cheap HMDs in combination with their smartphones just like for VR, with the difference being that an AR/MR HMD allows the camera on the back of the device to be exposed and pick up the surrounding environment. If cost and accessibility is a factor, using these devices can be a good option given many students already own a smartphone. The drawback to these devices is that students will not necessarily get the best experience when compared to a dedicated AR/MR device.
2. Smart Glasses: Much like smartphones and tablets, smart glasses are used more for AR applications, but not all smart glasses have AR functionality. These devices are meant to be worn when out-and-about so the technology is typically designed to be sleek and unobtrusive. To conceal the technology, it is designed to be as small as possible, which means you are often paying a lot more money for a lot less computing power when compared to other devices where the technology is not meant to be so inconspicuous, such as smartphones or tablets. On the other hand, smart glasses can offer a better AR experience than a smartphone or tablet by virtue of the user not needing to hold a device in front of them. As the glasses rest comfortably on the face, the user may not even be fully aware of their presence allowing for a more comfortable, seamless, and immersive AR experience.
3. AR/MR HMDs: Like smart glasses, these are worn on the head but with the key difference being that the technology is not designed to be as inconspicuous. So,

Table 8.1 This table lists and ranks the three main categories of HMD on a number of attributes, with 1 being the best in the category and 3 the worst

HMD Type	Smartphone HMD	VR HMD (Tethered)	VR HMD (self-contained)[a]
Example	Google Cardboard 	HTC Vive 	Oculus Quest 
Cost	1**	3	2
Ease of use[b]	1	3	2
Processing/Graphical power	3	1	2
Interactivity/Immersion	2	1	1
Least Space Required	1	3	2
Ease of development[c]	1	2	2
Experience	Seated VR	Standing and seated VR	Standing and seated VR

[a]Some self-contained headsets offer the ability to act as a tethered headset by streaming content from a computer via cable or wirelessly. The ranking in this table is based on using the headset as a self-contained device only
[b]Cost of a smartphone HMD is based on the presumption that the user already owns a compatible smartphone
[c]Ease of use refers to how easy the device is to set up and use which can be related to how technically simple a device is
[d]Ease of Development refers to the expertise needed in developing content for the device

while wearing one of these devices in public might draw some stares due to the noticeable size and design, you generally get more power and functionality for less when compared with smart glasses. This means these devices often offer the best AR/MR user experience. There is not the same variety of these headsets we see compared with VR HMDs but they too can come in tethered and untethered forms, with some tethered headsets also drawing their computing power from a pack that the user can wear on their body.

Use the table on the next page to help you decide which device may be best suited for your application. Now with an appreciation of the devices available you may wonder on a broader level whether VR or AR/MR is best for your content. Again, this will depend on the educational experience you wish to create, with VR perhaps being the best to use if realism and immersion are very important. For example, setting up a realistic surgical theatre for students to practice in is costly in terms of space, time, and money, but an immersive VR experience is probably the next best thing but without the ongoing costs. However, if your educational content works just as well with AR/MR then this may be the better option. This is because all that is needed to have an AR experience at the very least is a smartphone, tablet or similar device with a camera. As smartphones and tablets have already been widely adopted, it is easily the most accessible and cost-effective option. For example, you can have a lecture hall of students using their smartphones to share a joint AR/MR experience simultaneously, something that's not so easy to accomplish with VR without significant investment. Of course, you can also have a VR experience with a smartphone but the experience is often quite basic and limited, and also requires a basic headset, whereas you have a lot more functionality with AR/MR on smartphone devices.

8.5.3 Developing Content for VTs

Finally, let's consider some of the options available for educators when looking at content for VTs. We will explore four main options and discuss the strengths and challenges associated with each.

1. Premade Content: Under this heading, I include hiring content creators to make specific content in addition to content that's already been created. Hiring content creators is a good way to have your ideas translated into educational software with minimal impact on your time and if you do your homework, a reasonable assuredness that you will get what you want. On the other hand, it is likely to be costly unless you are fortunate to have an internal department of staff or students dedicated to developing content at minimal or no cost. If this option is not viable, then consider adapting premade content. There may be something already in existence that taps the same learning outcomes you wish to achieve at little or no cost.

   Examples: VR (medicine)—Anatomy software that allows anatomical features of the human body to be manipulated, dissected and explored. AR (astronomy)—software that

Table 8.2 This table list and ranks the three main categories of AR/MR devices on a number of attributes, with 1 being the highest and 3 the lowest for each attribute

AR/MR Device Type	Smartphone/Tablet	Smart Glasses	AR/MR HMD
Example	IPad Tablet 	Google Glass (Enterprise Ed.) 	Microsoft HoloLens 2 
Cost	1	2[a]	3
Accessibility[b]	1	2	3
Overall AR/MR experience[c]	3	2	1

[a]Smart Glasses can cost as much as a dedicated AR/MR HMD but they are generally cheaper
[b]Accessibility refers to how many people or institutions currently possess devices in this category
[c]This is judged by a range of factors including built-in functionality to provide a quality, interactive and immersive AR/MR experience (e.g. ability to go 'hands free' with the device.)

highlights the location of features such as constellations, satellites and planets in the night sky. MR (engineering)—software mapping the physical environment and gives guidance based on what the user needs. For example, if the user needs to learn to disassemble a car part, the software could map the part, highlight where the various nuts and bolts are, then recommend the tools needed to open each one.

2. 180°/360°Camera: Next to finding premade content, this is one of the easiest and most cost-effective ways of making a VR experience. You will recall earlier that with a smartphone and a basic headset you can experience 360° (or 180°) VR video. All you need to create this content is a 180°/360° Camera and something to record. You can then upload the video to a service such as YouTube which will make it available for students to stream in 180°/360° VR. Only one camera needs to be purchased for educators within an institution to make a range of different content and this requires neither programming knowledge nor ongoing costs. However, 180°/360° VR video experiences are the most restrictive in terms of the level of interactivity and types of content that can be created when compared to software development options. Also, recording 180°/360° is often trickier than standard video given larger file sizes and needing extra steps in post-production to get a final product. If recording 360° video also consider that there is no camera blind spot, so everything in the environment surrounding the camera will be recorded. This often requires careful planning of your environment so that only what you want to be included in the final video appears, either by controlling the environment or editing out those things you do not want in shot post-production.

   Examples: Type '180 video' or '360 video' into You Tube for examples of both.

3. Software Development Environment (game engine): If you have the time, programming knowledge and wish to have more development options than premade software or VR video, then programming your own educational experience may be an option. Software development tools offer a great degree of freedom for creativity in crafting tailored educational experiences and can be used to give 180°/360° video greater interactivity by programming various options into the video. For example, you could pose a question in the VR video and program two 'yes' or 'no' response options to appear. To select an option, the user has to look at either 'yes' or 'no' for a small period of time to select that response. Unfortunately, this option is ruled out for many time-poor educators who do not have the time (or perhaps inclination) to learn how to program their own software.

   Examples: Unity and the Unreal Engine are examples of game engines frequently used to create VR experiences.

4. Drag and Drop Software: We can consider this the middle ground to the restrictions posed by premade content and VR video options, and the flexible but time-intensive option software development. This software has been developed with those educators in mind that wish to use VTs but do not necessarily have the time or inclination to develop them from scratch. However, before we hail this as our panacea to all of our software development problems, it is important to be aware of potential drawbacks. These programs will often require an ongoing fee and

be sure to find out what happens to your creations if the provider ever withdraws support for the program or your educational institution decides not to renew their subscription. Are you still able to use your creations if this happens? If the provider withdraws support, how long before your creations become incompatible with contemporary operating systems? Moreover, this software still has its creative limits when compared to programming your own content.

Example: Drag and drop software will have a library of premade 3D models and a user friendly interface that allows the creation VR and AR applications without the need for programming knowledge.

Once you have chosen your hardware and software development tools, develop your educational experience and move to the final step, dissemination.

8.6 Dissemination Phase: Presenting Your Content

If you have reached this point in development, congratulations on bringing your idea full term into a fully-fledged educational experience using VTs. While most of the hard work is out of the way, do not celebrate just yet, there are a few more things left to consider.

8.6.1 Ethics

Ethical considerations are something you need to be aware of not just in the dissemination phase but throughout production. To demonstrate this, let's take a look at a well-known experiment in psychology called the Zimbardo prison study which saw ordinary members of the public who volunteered to participate in the experiment thrown into a mock prison environment. Volunteers were randomly selected to be either prison guards or prisoners. To make the mock prison environment realistic, a real prison was emulated as closely as possible down to the uniforms and prisoner jail cells. Things began well enough but quickly began to deteriorate as some of the more zealous 'prison guards' became quite tyrannical to the 'prisoners', and it was not long before the remaining guards followed suit. The experiment was designed to last 2 weeks but was ceased abruptly after only 6 days due to concerns of the mental wellbeing of the 'prisoners' on the receiving end of this treatment.

Would the Zimbardo experiment be something that would be good to teach students through the use of VR? Well, yes and no. The realism and immersion provided by VR could provide additional depth of understanding to how participants may have felt during the experiment. The sensory richness of experiencing this experiment in VR could help make for a more powerful learning experience than learning about it via a textbook or video. However, the potentially traumatic nature of the experiment combined with the immersive realism of VR could be a serious

source of discomfort for your students. If you decided to go ahead with making such an experience, serious thought, discussion, and testing would need to take place in order to circumvent undue discomfort. In this example, giving the option of viewing the experiment from a third-person perspective would help give personal distance from the events taking place. Preparing students through using warnings and instructions what to do if experiencing any discomfort during or after viewing the content would also help. As educators, it is important that in our quest to deliver the best educational experiences possible that we do so in a safe and responsible way.

8.6.2 Preparing Students for VTs

It is important to prepare students for their experience using VTs, particularly since it may be their first time using this technology. Try to scaffold the experience to reduce cognitive overload. If a student is using cognitive resources trying to figure out the technology it will interfere with their ability to pay attention to, and learn from, the content. Orienting the student to the technology beforehand through instructions and tutorials before presenting the educational VT will help prevent cognitive overload, technical issues, and frustration. One of the biggest sources of frustration particularly for online students is technical issues, so providing a troubleshooting section and a contact for help if the students should experience technical problems is also essential.

Finally, make students aware of the safety considerations they need to observe when using this technology. I have listed some key ones below, but it should be standard practice to require students to always consult the user instructions and safety information for the device before using:

- Make sure an appropriate amount of space is cleared in your surrounds before engaging with this activity.
- Make sure you are aware of your surroundings at all times when using the technology.
- Do not engage in this activity while around potential hazards (e.g. tripping and falling hazards), handling dangerous objects (e.g. knives), or doing tasks that require attention (e.g. driving).
- Cease using the device immediately if feeling dizzy, nauseous or otherwise unwell.
- Avoid prolonged engagement with the activity to prevent eye strain and fatigue.

8.7 Reflections and Recommendations

Think about the key points you will take from this chapter when developing your own educational content using VTs, from contemplation to dissemination:

- Make sure you have a 'why'. The content and associated learning outcomes should always come first, and the use of innovative technology should always be in the service of enhancing the educational material.
- While these technologies have many educational strengths, it is important to be aware that they also have their challenges. They should be thought of as another option in the educators toolbox that when used appropriately can enhance a student's educational experience.
- Consider your resources and audience when choosing the appropriate hardware needed to run your virtual education experience. Choosing or developing software will also be constrained by the resources and the different skill sets you have at your disposal.
- Orient students on how to use VTs before introducing them to your educational content and have reliable technical support available for when things go wrong.
- Always consider the ethics and accessibility of the content you are developing. Seeking a range of impartial feedback throughout project development from students, colleagues, ethics boards, counselling services and disability services will be valuable in ensuring this.

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Chapter 9
An Online Research Portal—An Integrated and Transferable Fully Online Research System

Stephen McKenzie, Zahra Aziz, Filia Garivaldis, and Matthew Mundy

Abstract Online education has experienced tremendous growth in recent years, however not all courses can easily be translated to the online mode of delivery, including those that require substantial academic research support and infrastructure, such as a traditional research project. To overcome this challenge, Monash University's School of Psychological Sciences developed the Research Portal, a fully online research system, initially to support its fully online Graduate Diploma of Psychology Advanced (GDPA). The pioneering, expandable, and transferable Research Portal is a convenient and comprehensive one-stop capacity for scoping, designing, conducting, analysing, storing, and writing-up a research project fully online. One of the unique features of the Research Portal is the Virtual Lab which allows users to select and/or create psychological measurement tools, and to acquire human research data by conducting and contributing to the development of online experiments, surveys, and databases. This chapter describes the context, development, course application, and utilisation of the Research Portal. The chapter also presents findings from an evaluation of the usability and user satisfaction of the Research Portal. The Research Portal has bridged the gap between online and traditional research, which substantially benefits on-campus as well as online education and research. This world-first research teaching support system has made a type of course previously thought impossible, the GDPA, a reality.

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9.1 Introduction

Demand from learners for increasingly flexible education, a squeeze on funding, and a limit on physical campus space has resulted in institutions rethinking their course delivery. This demand can lead to innovations in pedagogical practices, enabling universities to deliver online and mixed online/on-campus (hybrid or blended) teaching and learning more effectively. Online learning gives universities the potential to relieve the tightening on-campus education bottleneck that is particularly evident at postgraduate study levels, and for courses with large student numbers, such as psychology courses, as a result of limitations in space and other resources (Littlefield 2016).

Besides relieving education bottlenecks, online courses can potentially provide important advantages over on-campus courses, both pedagogically (allowed by their multimedia teaching and learning capacity), as well as in flexibility for students and staff (Roddy et al. 2017). The online mode can also increase the reach of education, by making education available to students in isolated and remote geographic locations, who are no longer required to leave their home communities in order to study and to gain professional qualifications (Garivaldis, McKenzie, & Mundy, in press).

Challenges for online courses include ensuring that online students feel fully supported, and connected (Trespalacios and Rand 2015), as well as ensuring educational equivalence with on-campus courses. There are also challenges for the development or conversion of particular types of online courses, including those with a substantial human research component, which require an online solution to a traditionally on-campus activity. Hence, an additional limiter to online course expansion has been a real or perceived lack of suitability of online methods to some aspects of pedagogy. This perception may explain why there are a few online courses offered that involve a traditional research thesis and concurrent research supervision.

Monash University's School of Psychological Sciences has developed the Graduate Diploma of Psychology—Advanced (GDPA): Australia's first fully online, accredited, large scale on-campus equivalent fourth-year Psychology course. In addition to three core and two elective coursework units, and a statistics and research design unit, the GDPA offers three research project units, which together comprise an online research thesis project. The development and implementation of the fully online Research Portal allows the GDPA to offer its students an independent project with dedicated research supervision.

The Research Portal (depicted in Fig. 9.1.) is structured according to the progression of the usual research sequence, and allows GDPA students and other users to conduct and participate in all aspects of research fully online, including research design; research participant acquisition; data collection, analysis, storage, and dissemination. Whilst the Research Portal was iteratively developed to meet the needs of a particular course and its students, it can potentially be used to support other online courses and course settings.

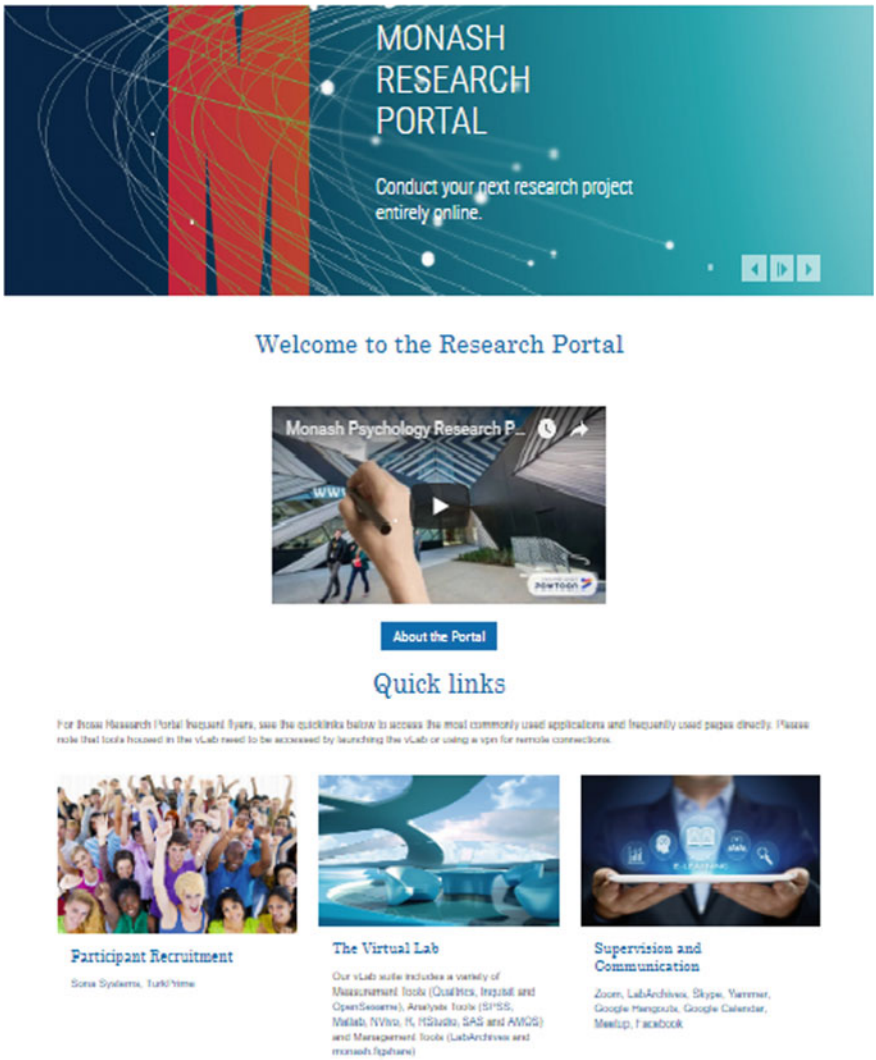


Fig. 9.1 The Research Portal's home page

9.2 Research Portal Features

The Research Portal is a transferable and expandable one-stop online research solution, that enables the scoping, designing, conducting, analysing, storing, and writing-up of online research projects, all under the guidance of a supervisor who can monitor and review the process both synchronously and asynchronously.

Features of the Research Portal which ensure an optimal and valuable user experience include clear and logically structured research components, comprehensive

and easy to follow instruction videos, comprehensive user support, strong visual appeal, and a public access component which includes interesting research news and research participants' acquisition. The Research Portal has three major components consisting of

1. ***Information and Educational Resources***: A range of resources and information on research in general and on University-specific research projects is available in the Research Portal. It provides detailed guidance on producing each of the components of a research project including identifying a research topic, obtaining ethics approvals, selecting measures, selecting participants, collecting and managing data, analysis data, and writing a report. There is also a news and events corner aimed at sharing public research news, events, and networking capacity.
2. ***Supervision and Communication Tools***: The Research Portal includes a total online research supervision capacity, using the 'Zoom' communication platform that provides a capacity for students and their supervisors to schedule, conduct, and record project meetings, and store detailed project notes and information including secure data and drafts, using the LabArchives electronic workbook.
3. ***Virtual Lab***: The most unique and purpose-built feature of the Research Portal is its Virtual Lab (vLab) component (Fig. 9.2.) which allows its users to select and/or create measurement tools and to acquire research data by conducting and contributing to the development of online experiments, surveys, and databases. The vLab also provides a capacity to recruit and select research participants online, using the TurkPrime international research participants database, social

Fig. 9.2 The list of applications available on the Research Portal's vLab

media recruitment, and a university research participants database—SONA. The vLab provides an integrated environment for data collection, analysis, and storage and includes a suite of research applications including

- **Quantitative analysis**: SPSS, MATLAB, SAS, R, RStudio
- **Qualitative analysis**: NVivo
- **Survey administration**: Qualtrics
- **Experiment administration**: Inquisit Lab, Inquisit Web
- **Data storage**: Figshare, LabArchives (storage capacity).

A key development progression of the research portal was the use of the CITRIX platform for the Research Portal's Virtual Lab component, which resulted in a substantial functionality improvement and removal of the need for an earlier implementation of VPN remote access. AI-like features are currently being added to the Research Portal commencing with a Chatbot that will support online research students 24/7 by providing answers to a range of questions. Individual research user and user type (e.g. quantitative or qualitative)-based user pathways will be developed, which will effectively create multiple Research Portals.

9.3 Research Portal Reach, Use, and Effectiveness

The first cohort of GDPA research project students consisted of just over 80 students commencing the first GDPA research project unit in September 2016. There are currently approximately 1200 users of the Research Portal, consisting of approximately

- 600 online GDPA student and staff users
- 500 on-campus psychology second- and third-year student and staff users
- 100 on-campus psychology Honours users.

Figures 9.3 and 9.4 show the usage of the Research Portal for the first three GDPA online Teaching Periods in 2019. Graph 9.1 shows the increasing Research Portal use since its launch. Key usage information is the overall number of times that the Research Portal was accessed, and the number of times that its components were accessed.

Student evaluation scores for the three GDPA research project units have been good, with average scores (out of 5) for overall median student satisfaction across the three years of operation of the GDPA course all being above a score of 4 out of 5.

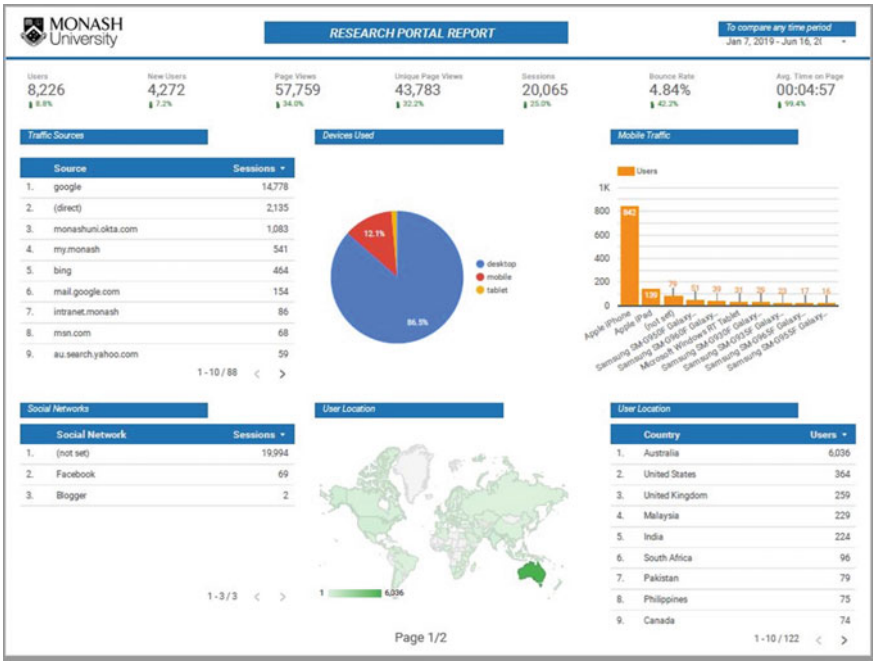


Fig. 9.3 Frequency of Research Portal/vLab use in 2019

9.4 Research Portal Educational Implications

The Research Portal has allowed the launch of an online course that has expanded online education access to include courses with a substantial online component and has overcome the physical restraints of research and traditional research projects. To illustrate, the scope of such access is demonstrated by a comparison between the GDPA's 500 actively enrolled students per 6-week teaching period and the on-campus equivalent full-year fourth-year Honours course that caters for approximately 90 students per year. In Australia, the fourth year in psychology is a capstone year of a three-year undergraduate course, with a psychology major, and the minimum educational qualifications required for students to progress towards registration as a psychologist. The development and implementation of the online Research Portal has therefore contributed to a large reduction in the educational bottleneck of students wanting to progress in their accredited professional psychology pathway.

The Research Portal project has allowed the creation of a new pedagogical practice, supporting the completion of a research project in the fully online mode, and is an important and transferable online teaching and learning resource. The Research Portal is now linked to every GDPA unit's learning management platform, i.e. Moodle, and it allows GDPA students to maintain research activity as desired outside of their research unit teaching periods. The Research Portal has made

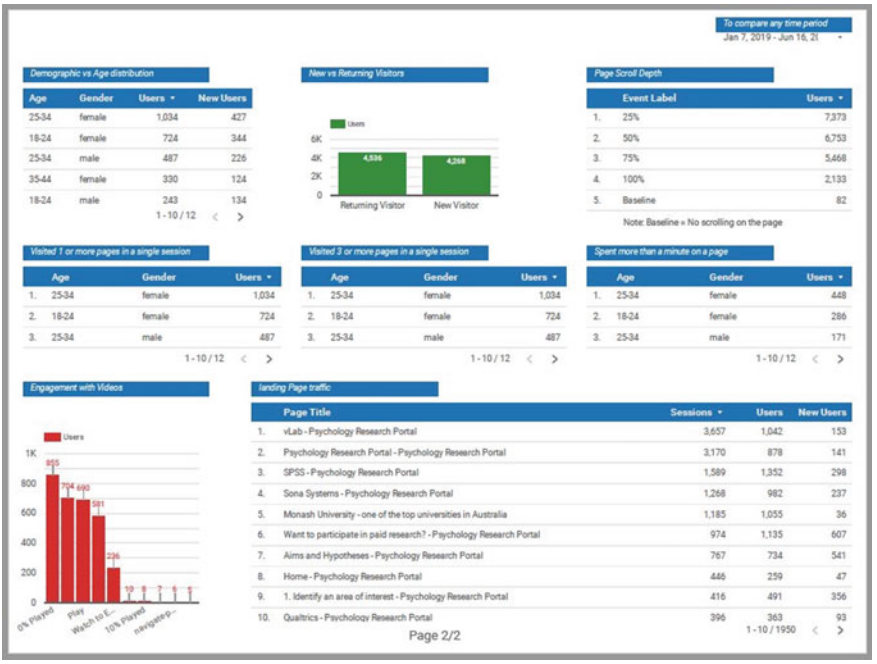
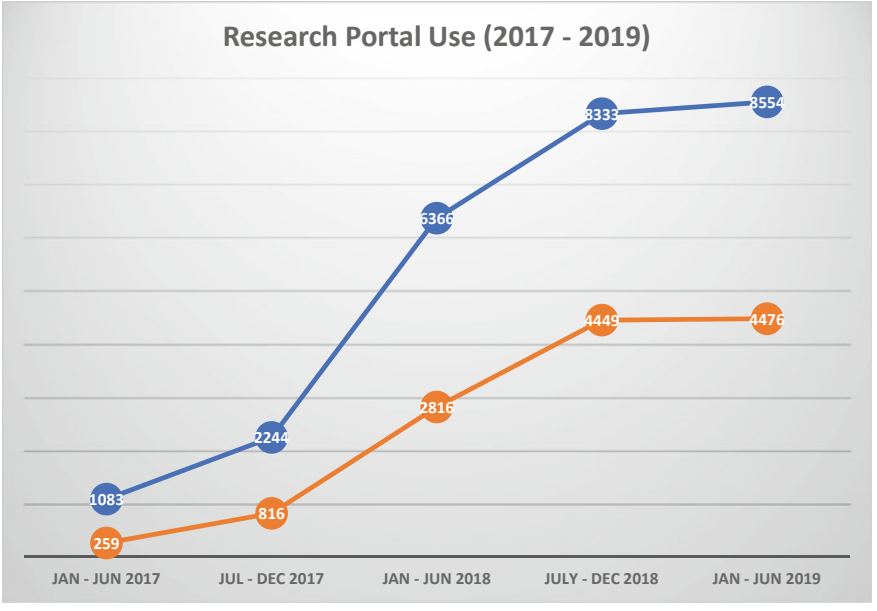


Fig. 9.4 Pattern of Research Portal/vLab use across user types and component



Graph. 9.1 Frequency of Research Portal/vLab use since its implementation—all users (top line) and new users (bottom line)

it possible for Monash University's School of Psychological Sciences to successfully offer the world's first large-scale fully online fourth year course, including a substantial research project component.

The development of the Research Portal is an important teaching innovation that has required substantial educational leadership and scholarship. The development process required close collaboration of academic and IT staff, who together developed the user flow design and successive versions of the Research Portal, and on an ongoing basis provide technical support to users. Technical development, in particular, needed to be led by academic staff with a deep understanding of its purpose and potential. Staff also needed an ongoing capacity to convey this understanding to the technical development teams, and to direct development based on achieving optimal educational as well as technical outcomes, whilst ensuring these outcomes were based on scholarship. The development of the Research Portal was guided by education first principles, including the need for its users to achieve and benefit from academic excellence, via academic excellence of its components, as well as to achieve pedagogical excellence in the Research Portal user's experience, information, and instructions.

Research related educational objectives were linked to the technical development of Research Portal features via the translation of the traditional research and research support sequence into a series of operational steps, each supported by a sequential feature of the Research Portal. The students' and other users' choice of a research topic is supported by information on potential research topics, data acquisition is supported by an online data collection capacity, data analysis is supported by a wide range of vLab analysis applications, and ongoing student supervision is supported by an online supervision environment and a student–supervisor shared electronic notebook/information sharing and storage system.

The development and implementation of the Research Portal is a transferable example of the successful planning, development, and preparation of pioneering online teaching and learning resources and activities, allowing a paradigm shift in teaching and learning. The planning, development, and implementation of the Research Portal have involved coordination, involvement, and leadership in curriculum support design, and have included innovative expansion of traditional learning space to a virtually limitless online environment.

9.5 Research Portal—The Next Generation

The Research Portal's use will be expanded within Monash University to undergraduate and Higher Degree students and staff across the University.

A 'second generation' of the Research Portal is being developed which will substantially improve its current usability and individual user experience by developing Artificial Intelligence (AI) features beginning with a user supporting Chatbot. Eventually, the portal's features will include voice recognition, and a predictive

analytics engine to create an intelligent virtual assistant that provides research students and other research users with research-specific advice.

The addition of an AI Chatbot to the Research Portal will allow timely response to students' questions, and may also have a positive impact on student retention and success, as online students often feel overwhelmed during the early stages of their research journey and tend to seek frequent intermissions (Roblyer 2006; Rovai and Wighting 2005; Simpson 2004). As AI educational solutions continue to mature, it is anticipated that their incorporation in the Research Portal will substantially improve its capacity to create new opportunities for research-related online learning and teaching at Monash University and beyond it. The second generation Research Portal will further improve research students' and researchers' efficiency, via its increased responsiveness to their research support needs, and will increasingly allow research supervisors to focus on complex research queries (Sarvady 2017; Winkler and Söllner 2018).

9.6 Reflections and Recommendations

The Research Portal evolved from a vision to an idea to a reality—a unique dynamic interface between teaching (including research supervision) and learning (including learning of transferable skills). The Research Portal has not just refined or improved the capacity of online courses to include a substantial student research component, it also has created this capacity. The development and implementation of the Research Portal involved overcoming great challenges as well as recognising great opportunities. It is recommended that future developments and implementations of online research portals start where this pioneering implementation finished, and therefore valuably learn its full lessons and realise its full potential.

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Part II
Student-Centred Online Education

The education sector is waking up to new approaches to and possibilities in delivering teaching and learning. A big part of the development of these approaches is an emphasis on creating online education practices that are student-centred. Keeping the student at the centre of the growth of online education will help ensure that this form of education is purposefully, respectfully, and sustainably derived; addressing student learning, engagement, and retention, respectively. This part of the book, therefore, highlights key issues and challenges for students studying in the online mode, and provides insights and solutions that are related to four pillars of online student success (Roddy, et. al., 2017).

The first pillar of online student success is that of academic support, which is arguably the most important as it concerns the extent to which students can flourish and succeed in the online environment. Academic support is the primary responsibility of the educational institution and teaching staff. In line with this pillar, there is a chapter on the need to base online design and deliver on evidence (Chap. 10), a chapter on how student success should be promoted in different ways across disciplines rather than generically (Chap. 11), a chapter on how contextualisation of the learning content can bring the student closer to the source of their learning (Chap. 12), and a chapter on how making transparent academic practices promotes perceptions of academic justice and student well-being (Chap. 13).

The second pillar of online student success is that of technological support. Technological support is students' immediate need, unique to the online teaching and learning medium, and critical in creating and sustaining learning engagement. By harnessing the strengths of technology, and overcoming its constraints, teaching and learning can be an authentic person-centred experience (Chap. 14), and offer opportunities that widen participation and inclusivity of a growing in diversity student body (Chap. 15). With technology fluency, teachers, learners, and course leaders, to name a few, can make small incremental changes to practice to enable creativity and innovation (Chap. 16).

The third pillar of online student success is health and well-being, and the fourth pillar is sense of community and belongingness—both of which are essential to online learning but often taken for granted. Learning online can be lonely and bewildering,

unless educational practices are offered that help surpass and manage the challenges of learning in isolation. Providing education that has the whole student as professional in training in mind offers a well-rounded learning experience that will continue to give to the student beyond course completion (Chap. 17). Well-being and belonging needs can be fostered by open communication with peers and teachers through familiar platforms, without competing with students' other life demands (Chap. 18). In time, happy and fulfilled online students can progress through the hierarchy of needs, towards online learning self-actualisation (Chap. 19).

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Chapter 10
Back to the Education Future—Evidence-based Student-Centred Approaches to Online Curriculum Design and Delivery

Jacquelyn Cranney, Sue Morris, Lidija Krebs-Lazendic, and Kate Hutton-Bedbrook

Abstract Despite its great potential, the value of higher education has recently been questioned, inasmuch as it does not always 'translate' to economic and social prosperity. Regardless of our modes of course delivery (traditional classroom, blended, or totally online), as educators we need to rethink what higher education learning outcomes should be (both generally, and specific to the discipline/profession), and use a scholarly and preferably evidence-based approach to the design and delivery of curricula that afford students optimal opportunities to acquire desired learning outcomes. In this chapter, we approach this issue by firstly considering the scholarly work on desired outcomes of higher education in general, and of undergraduate psychology education as a specific example. In considering the latter, we introduce the concept of psychological literacy (the capacity to utilise psychological principles to achieve personal, professional and societal goals). Secondly, we argue that, from a professional and ethical perspective, all educators (regardless of discipline), including online educators, must take an evidence-based approach to curriculum design and delivery, with particular emphasis on the processes of backward design and constructive alignment. We outline three different evidence-based frameworks for achieving that goal. Thirdly, we describe two recent and ongoing online education Case Studies regarding the design and delivery of (1) a single online unit on the Psychological Science of Well-being, and (2) a Graduate Diploma (10 units) in Psychology. For each Case Study, the reasons for these undertakings, the approaches taken and findings so far are briefly outlined. Some general recommendations and conclusions are then given.

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10.1 Context and Frameworks

> The aim of education is not only to prepare students for productive careers, but also to enable them to live lives of dignity and purpose; not only to generate new knowledge, but to channel that knowledge to humane ends; not merely to study government, but to help shape a citizenry that can promote the public good. Thus, higher education's vision must be widened if the nation is to be rescued from problems that threaten to diminish permanently the quality of life. (Boyer, 1990, pp. 77–78).

Despite this great potential ascribed by Boyer, higher education does not always 'translate' to economic and social prosperity, and so its value has recently been questioned (e.g., Association of American Colleges & Universities, 2015; Carnevale, Garcia, & Gulish, 2017; but see Augar, 2019). This situation varies across different national higher education systems and different disciplines and professions; here, by way of example, we briefly explore one discipline: psychology. The utility of undergraduate psychology education has been challenged in several countries; for example, Halonen (2011) wrote a White Paper in response to concerns that too many psychology major graduates were being produced in Florida, with no clear career destination.

Partly in response to the general questioning of the value of higher education, a review of undergraduate psychology education in the USA was undertaken (Halpern, 2010). During that review, the concept of psychological literacy was revived (McGovern et al., 2010), which was then defined in terms of nine graduate capabilities for the psychology major: knowledge, valuing scientific thinking, creative problem-solving, applying psychological principles, acting ethically, using and evaluating information and technology, communicating effectively, fostering respect for diversity, and critical reflection. Later, psychological literacy was more generally defined as the capacity to intentionally use psychology to achieve personal, professional and societal goals (Cranney & Dunn, 2011; Cranney, Botwood, & Morris, 2012). It has been argued that a moderate level of psychological literacy should be the general outcome of an undergraduate education in psychology (Morris et al., 2013), and this sentiment is reflected in the program accreditation standards in England (QAA, 2016), and in the *Principles for Quality Undergraduate Education* in the USA (APA, 2011). Essentially, psychological literacy should be the integrative meta-concept encompassing the internationally recognised set of psychology major graduate capabilities (McGovern et al., 2010; Murdoch, 2016). At this juncture, it could be argued that in the context of undergraduate psychology education, the desired outcomes in terms of psychological literacy are now aligned with the general outcomes of higher education that Boyer (1990) maintained were crucial to our future (Hulme & Cranney, 2020).

To take this further, we would argue that, from a professional and ethical perspective, in order that students, including online students, are provided with optimal opportunities to acquire the desired graduate capabilities (or 'learning outcomes' at the program or unit level), all educators including online educators (regardless of discipline) must take an evidence-based approach to the design and delivery of

curricula. Central to this is the process of constructive alignment (Biggs, 1996), whereby educators first determine desired learning outcomes (that should, we argue, deliver on Boyer's vision), and then design (a) the teaching and learning activities that support students in acquiring those outcomes, and (b) authentic assessments to 'measure' those outcomes. A closely related concept is 'backward design' (Wiggins & McTighe, 2005), whereby the long-term relevance of the learning outcomes to both the individual and society are particularly emphasised (compatible with Boyer's vision). In essence, curriculum renewal and alignment are essential to facilitate student learning of the desired (meaningful) outcomes.

But what *are* effective evidence-based teaching and assessment strategies to support student learning in relation to desired outcomes? There are many approaches, but here we outline three frameworks that we have found particularly useful in designing and delivering curricula in an evidence-based way.

The first framework emphasises the fact that we as educators create the curriculum environment, and of course the environment shapes human behaviour, including students' engagement with learning. One way to shape the learning environment is to design and deliver curricula that support the three basic psychological needs posited by Self-determination Theory (SDT; Ryan & Deci, 2000): relatedness, competence and autonomy. SDT has received significant empirical support in a variety of contexts including educational settings. One example of an educator resource that uses need satisfaction as a basis for curriculum design and delivery is Enhancing Student Well-being (2016). In particular, this online resource gives examples of how students' basic psychological needs can be either supported or thwarted through the delivery of teaching and assessment strategies.

A specialised aspect of creating a need-satisfying curriculum environment is to integrate opportunities for students to develop self-management skills relevant to academic success. Self-management is the capacity to effectively pursue meaningful goals, and to be flexible in the face of setbacks (Cranney et al., 2016; Morris et al., 2018). Within higher education contexts, self-management skills for effective learning that align with these basic psychological needs include the capacity to determine self-congruent academic goals (autonomy), communication skills for collaborative learning (relatedness) and effective study skills (competence; see Dunlovsky et al., 2013).

The second framework is based on the idea that psychological science has delivered evidence-based principles that educators, including online educators, can and should utilise in curriculum design and delivery (Carroll et al., 2018). For example, Worrell et al. (2010) identified, as part of their Dynamic Process Model of Teaching and Learning, a number of 'promising principles' that included: desirable difficulties; deep explanatory processing; organisation effects; spacing or distributed learning; testing as a teaching device; metacognition; transfer appropriate processing in new contexts; and teacher and learner as wholistic agents. Examples of translating these promising principles into practice are (1) principle: testing as a teaching device; practice example: set quizzes to promote learning; (2) principle: metacognition; practice example: "Teach students to delay judgment of their own learning until after a meaningful delay" (p. 133).

The third framework is based on Stone's (2017) *Opportunity Through Online Learning* report. The major principles include (a) "Intervene early to address student expectations, build skills and engagement" (p. 7); (b) "Explicitly value and support the vital role of 'teacher-presence'" (p. 8); (c) "Engage and support through content and delivery", including "timely, constructive and specific feedback" (p. 10); (d) "Contact and communicate throughout the student journey", including that messages "are personalised based on a student's activity and behaviour, and tailored to their needs in real time" (p. 11).

In summary, unit and program coordinators should strive to be "scientist-educators" (Bernstein, 2011) by using evidence-based practice in supporting student learning, including online student learning, and by striving to be critically reflective practitioners in the process of continuous improvement. By taking this approach in psychology education, we are also displaying a certain level of psychological literacy in our practice by intentionally applying psychological knowledge to the educational context, and indeed, psychological literacy becomes our pedagogical philosophy (Cranney & Morris, 2020).

We now describe two recent and ongoing Case Studies regarding the design and delivery of (1) a single online unit on the Psychological Science of Well-being, and (2) a Graduate Diploma (10 units) in Psychology. For each Case Study, the reasons for these undertakings, the approaches taken, and findings so far are briefly outlined. Some general conclusions and recommendations are then given.

10.2 Case Study 1: Design and Delivery of an Online Unit on the Psychological Science of Well-being

This online unit was created to establish a second avenue for the delivery of material on the psychological science of self-management, success and well-being. The original context was within a highly successful flipped classroom unit, but its current reach is limited to fewer than 100 students per offering. In contrast, a totally online delivery potentially provides access for more students. The curriculum material in these two units is particularly relevant to university students, in that it provides not only theoretical and empirical knowledge regarding evidence-based self-management, but it also provides students with opportunities to apply this knowledge in order to increase their self-management capability.

As with the original flipped classroom course, in our unit design we attempted to use principles from learning science (e.g., Worrell et al., 2010) and from reviews of online learning strategies (e.g., Stone, 2017), and we were also strongly influenced by SDT in our curriculum design and delivery. We give two examples. Firstly, in the flipped classroom unit, in lieu of lectures, students had to complete a number of 'pre-practical' tasks (e.g., write summaries of readings or videos; complete and score a survey) that were relevant to the next face-to-face weekly 'practical' session

with the instructor. This was critical to scaffolded learning (Worrell et al.'s "desirable difficulties"), particularly as the practical activities built upon the pre-practical tasks.

In order to motivate students to complete the pre-practical tasks, the tasks were assessable in two blocks with hurdle requirements (e.g., if completed less than 80% on time, a mark of zero would be given), and assessment feedback was given after the first block. We decided to adopt this approach in the online unit, but given the totally online context and the lack of an instructor 'in situ' to remind students of the hurdle assessments, we created four modules comprising fortnightly blocks of tasks. Each module specified readings, which included the custom-written course textbook (Morris et al., 2018), with most online tasks extracted from the textbook. We also ensured that students received feedback on their hurdle module marks within a week, so that they could adjust their current learning behaviour accordingly (i.e., keep working effectively, or 'raise their game'; consistent with Stone's feedback recommendation).

We publicised good student responses (with permission), and we reached out to students who were floundering (personalised messages, as recommended by Stone). At the end of each module, there was also a quiz with immediate feedback, in line with Worrell et al.'s promising principle of testing as a teaching device. Overall, this kind of scaffolded learning, with rapid feedback, should build students' sense of competence (SDT; Ryan & Deci, 2000), and some support for this notion is provided by the students' mean (M) unit evaluation rating of 5.12(/6) for "The assessment tasks were relevant to the course content" (*cf.* University $M = 5.01$). The need for autonomy was embedded in the assessment task, where students could choose any aspect of the unit to focus on developing their final project. Many of the module tasks encouraged students to refer to an aspect of their own life, again in an attempt to foster a sense of autonomy.

A key aspect of the SDT approach is to support students' need for relatedness. In the flipped classroom unit, this was accomplished through carefully constructed classroom activities whereby most class activities and discussions occurred in a collaborative context, and through a group project. In the first delivery (2019) of the fully online unit, we decided not to require a group project because, having never tried this strategy online before, we were not confident that it would be successful, and we thought it best to establish and evaluate the other individually oriented assessments first. We did, however, require students to interact with each other, initially in an icebreaker activity on a Discussion Forum, and later as assessable tasks within the Modules, whereby students would comment on other students' submissions. In this way, we tried to create a sense for students that they were part of a learning community. Nevertheless, we expected that the need for relatedness would not be as well satisfied in the online unit compared to the flipped classroom unit, and an initial inspection of the student unit evaluation ratings indicated that fully online students did not feel as much a part of a 'learning community' ($M = 4.32$/6) as did the flipped classroom students (5.58). During the process of reflection and continuous improvement, we will consider what evidence-based strategies we can feasibly attempt in the next delivery of the online unit, particularly in an attempt to satisfy the need for relatedness.

In general, the new online unit received high ratings (e.g., 100% agreement "Overall I was satisfied with the quality of the course"; *M* rating = 5.04/6, *cf.* Flipped = 5.50, *cf.* University = 4.76), and our aim in creating this course was achieved.

10.3 Case Study 2: Graduate Diploma in Psychology

The Graduate Diploma in Psychology is a fully online program designed to enable graduates from other disciplines to expand their career choices by completing an accredited three-year sequence in 1.7 years. The creation of the program is in line with the university's educational priorities to provide more flexible educational options through the effective use of digital technologies.

The program consists of 10 units: 3 introductory units and 7 advanced units covering the core subjects required for an accredited sequence in psychology. The students must complete the introductory units before proceeding to advanced units. The curriculum content of the 10 units is based on the content of the units delivered in face-to-face mode on campus. The face-to-face unit content was redesigned to be delivered in 6 weeks rather than in 10 weeks, and to allow for independent and self-paced learning in the online learning environment. The program also provides enrolment flexibility, as there are six enrolment periods throughout the year. When designing and delivering the Graduate Diploma in Psychology units, we applied the principles of online teaching and learning (Stone, 2017) within the Dynamic Process Model of Teaching and Learning framework (Worrell et al., 2010), taking into account the key differences between the online and face-to-face on-campus teaching and learning environments. The nature of the Graduate Diploma program and the targeted demographics mean that the students enrolled in the program differ from their on-campus peers in age, as well as in their professional experience and educational background, resulting in greater diversity in our online cohorts than in our on-campus cohorts. Thus, our online content development and delivery was guided by the principles of inclusive teaching (Hockins, Brett, & Terentjevs, 2012) and the development of intervention strategies for online students (Tung, 2012). In addition, the units were designed to promote and encourage independent student engagement with the content through the development of a variety of activities and assessments and the use of different technologies, presentation styles and delivery modes (e.g., video recordings, podcasts, articles, interactive learning modules and quizzes). Finally, these activities were consistent with the principles of effective learning in the classroom (Worrell et al., 2010).

For example, there are six weekly topics for each unit. The activities within each topic range from readings and quizzes based on scaffolding (i.e., the students are guided to learn through generating answers to the questions) to the interactive modules and other practical activities designed to promote deep explanatory processing (i.e., the students are encouraged to provide explanations to more complex problems and to engage in discussions with other students in order to expand their understanding of the subject). These concepts are then further discussed in the

synchronous webinar online tutorials with academic staff, who guide discussions, helping students to integrate their knowledge, and to apply it to new situations and examples. Finally, the students are required to write written assessments for each unit to demonstrate their knowledge is transferable to new contexts. The academic staff (a) provide students with instructions and strategies for writing their assessments, (b) monitor their progress and (c) provide feedback to enable further learning.

This interaction between staff and students is the most crucial component of our online learning practice. One of the criticisms of online education is that the students are more likely to fail or withdraw from online than face-to-face units (Luyt, 2013; Morris, Xu, & Finnegan, 2005) due to, among other factors, their feeling of isolation and disconnection (McInnery & Roberts, 2004), and lack of participation and engagement with the material (Wiese, Speer, Marbouti, & Hsiao, 2013). In our online program, we focus on creating and maintaining a close relationship between staff and students, as well as fostering a strong sense of students' belonging to the group. All units within the program were designed to provide an active learning environment in which both students and staff are always present, engaged and demonstrative.

So far three student cohorts have completed the introductory courses. We have only received evaluations for Introduction to Psychology 2, and they were positive. Specifically, the mean rating for "I felt part of the learning community" was 5.50/6 (cf. School of Psychology = 4.61, cf. University = 4.66). We have shown that with the support of the teaching staff, the students enrolled in online programs do not feel isolated and disconnected.

10.4 Reflections and Recommendations

Delivery of units and programs entirely online should afford advantages such as flexibility in terms of fewer 'time and place' constraints. This is particularly important for future-oriented education in terms of (a) encouraging diverse participation (i.e., not all students can economically or socially 'afford' to enjoy a traditional individualistic on-campus educational experience), and (b) the increasing need for retraining in a world where lifetime career is an increasing rarity. Technological advances continue to provide the opportunity to deliver both blended and fully online classes in a more engaging way, assuming that the unit leader understands how to most effectively implement both the technology and the pedagogy. A major challenge is the building of learning communities in an online environment, and the Case Studies here had different aims, strategies and thus different outcomes regarding the student experience in this regard.

More specifically, we recommend that in order to enhance student engagement and quality of learning, scientist-educators (in both online and face-to-face classes) take a learner-centred approach, and in particular:

(1) incorporate evidence-based principles in curriculum design and delivery;

(2) explicitly endeavour to support and embed the psychological needs of relatedness, competence and autonomy through teaching and assessment strategies (such as those described above); and in particular

(i) support the satisfaction of the need for autonomy, by, for example, (a) allowing students to control the pace of learning and giving them some choice in learning and assessment activities; and (b) presenting content in different formats (e.g., videos, readings, interactive lessons and lectures), which may appeal to different types of students;

(ii) support the satisfaction of the need for competence, by, for example, scaffolding learning activities, particularly in relation to threshold concepts, and ensuring frequent opportunities for the development of metacognition (e.g., predicting their performance on assessment tasks and reflecting on how their behaviour affected their performance);

(iii) support the satisfaction of the need for relatedness by, for example, emphasising collaboration and communication with other students and with instructors; and encouraging students to actively seek and share information, whereby they also come to appreciate multiple perspectives.

10.5 Conclusion

In conclusion, we are grateful to our colleagues who openly shared their knowledge and experience regarding online design and delivery, and also to those who created the frameworks for evidence-based teaching which, although differing in their orientation, provide valuable guidance in online curriculum design and delivery. The key is to share our scholarly approaches and findings, and that is what this book is about.

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Chapter 11
"Same Same or Different?" Predictors of Student Success in Online Courses

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Abstract Recent advances in technology have influenced the way educational curricula are utilised outside of traditional classrooms. With more higher education institutions offering online alternatives, it is increasingly important to examine the key predictors of student success in online tertiary education. A research project conducted by the Monash Online—Psychology Education Division (MO-PED) included a review of the predictors of student success literature, followed by focus groups conducted with students, instructors and instructional designers from an online course in Psychology. The study revealed several important findings, most importantly, that discipline-specific factors, rather than generic factors, can be key indicators of effective online learning in any given degree. In the case of the psychology course, a key indicator of effective learning is learner resilience, driven by the sensitive nature of the content delivered in the course. Understanding such discipline-specific key indicators of effective online education success—for online psychology students and more broadly—will allow course designers and administrators to develop strategies specific to the student demographics and content of a course.

11.1 Introduction

As described in other chapters of this book, online learning, or e-learning, has fast become an alternative form of education, particularly appealing to older, employed and place-bound individuals (Brinkley-Etzkorn, 2018). The rapid increase of available online courses worldwide has meant that course instructors and developers increasingly need to know and understand the key predictors, both academic and non-academic, of online student success. Over recent years, there has been an increase in the number of published research outlining some of the learner characteristics of online student success in higher education, such as students' locus of control (Joo, Lim & Kim, 2013), motivational beliefs (Al-Azawei, Serenelli & Lundqvist, 2016)

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and self-regulated learning (Broadbent & Poon, 2015), some of which will be briefly outlined in this chapter.

In addition to knowing and understanding the key student predictors of online student success, it is also important for course instructors and developers to acknowledge the significance of discipline-specific student predictors that are unique to online courses, as well as general predictors, to fully assist in the success of their students. To illustrate the importance of understanding discipline-specific predictors of online student success, this chapter will present and draw conclusions from the findings of a research study conducted by the author and others that examined predictors of online student success specific to a particular low paradigm discipline that typically attracts large numbers of online students—Psychology (Arulkadacham et al., 2020). Specifically, this chapter highlights that discipline-specific predictors of student success exist and are relevant and powerful to understanding student success in online education, alongside more well-known generic predictors of student success. The chapter will conclude with some take-home online education reflections and recommendations.

11.2 What is Student Success?

The definition of student success is varied and changes according to whom you are asking about it—the tertiary student or instructor, the course developer, the institution or external agencies. Moreover, there are substantial differences in the definition even within these groups. For instance, from the perspective of the student, student success may be interpreted as individual achievement levels (i.e., academic grades) (Kinzie & Kuh, 2017), satisfaction with the course, perceived experience and perceived value of the education they have received (Al-Samarraie et al., 2018), and employability. Indeed, the interpretation of student success can vary across students and can be dependent on a number of factors. For instance, a traditional 18–21-year-old tertiary student who recently graduated from secondary education may place major significance on academic grades, as these contribute to their Weighted Average Mark (WAM) or Grade Point Average (GPA) and can consequently affect their entry into postgraduate studies whereas, a mature age student who is already employed full-time may put more emphasis on the transferability of their learnings directly to their workplace.

Indeed, the student's perspective of success differs from the perspective of an institution, which can define student success as, amongst other things, the completion of a degree, obtaining content knowledge and proficiencies and overall engagement with the course content, assessments and activities (Kinzie & Kuh, 2017). External agencies however may define student success as access to affordable tertiary education, and positive employment outcomes and graduate salary.

This chapter will focus on student factors (such as personality) as influences of student success (including both academic and non-academic factors) in online courses. Although there is often a focus on academic predictors of student success,

such as entry-level requirements into a course, this chapter will highlight the significance of non-academic predictors, such as student motivation and self-efficacy, and the need to consider these as well as academic predictors when considering overall student success.

11.3 General Student Predictors of Online Student Success

Designing, developing and delivering quality online courses is becoming increasingly important as the number of online courses and online student enrolments increase. A broad range of factors including course structure, instructional design, technology, instructor and student factors can influence the quality of the education experienced in an online mode and need to be considered when developing and delivering an online course. Indeed, student factors are one of the most important elements to take into consideration when developing and delivering online courses and are the focus of this chapter. These factors include the learner's style and engagement with learning content (Al-Azawei, Serenelli & Lundqvist, 2016), past experience with/use of online chat rooms (Baxter & Haycock, 2014), self-regulated learning and self-efficacy (Broadbent & Poon, 2015).

11.3.1 Engagement with Learning Content

Engagement refers to the student's motivation, energy and time spent interacting with course content outside the online classroom. Understanding student needs will help online instructors use multiple approaches to help students optimally engage with their learning content. What is important to remember here is the significance of incorporating various learning tools to optimally cater to the needs of various students. This allows the course content to be more engaging to a wide range of students, thus allowing success across students.

There are different ways to create engaging online academic content, including keeping the learning modules short and using a mix of video and written content throughout learning modules. Additionally, online courses can also enhance student engagement-related learning success by interspersing interactive and multimedia elements throughout the course. There are various ways to intersperse interactive and multimedia learning elements throughout an online course, including by using various Learning System plugins specifically designed for learning management systems, like H5P.

11.3.2 Students' Past Experiences/Use of Online Chat Rooms

Online courses often consist of forums and other online communication modalities which students are required to use throughout their studies. These forums can be specifically linked to their instructor, which provide a communication avenue for assignment-related queries or content-related questions. Moreover, these modalities are used as a simple way to engage and maintain student-to-student relationships as well as student-to-instructor relationships. Communication with instructors and/or peers via forums and the like have been linked to student success (Baxter & Haycock, 2014), which means that the more confident the student is in using such forums, the more they are inclined to use such platforms.

Given that it can be quite daunting to post a question online that is exposed to all peers and instructors, students' experience with using online chat rooms often provides online students with the confidence that they need to use such platforms comfortably, and consequently leading to their success in the course (Baxter & Haycock, 2014).

11.3.3 Self-regulated Learning

Given that online students are required to be more independent in their learning than non-online students due to the self-directed nature of the online mode, it is more important for these students to be able to control, manage and plan their learning tasks (Broadbent & Poon, 2015). This regulatory process is referred to as self-regulated learning (SRL; Zimmerman, 2008). Specifically, research has shown that self-regulated learning strategies of time management, metacognition, critical thinking and effort regulation have significant positive correlations with academic success in online settings (Broadbent & Poon, 2015).

11.3.4 Self-efficacy

Self-efficacy refers to "beliefs in one's capabilities to organise and execute the courses of action required to produce given attainments" (Bandura 2010, p. 3). Research has illustrated that self-efficacy is a strong predictor of academic success (Aurah, 2013; Bartimote-Aufflick, Bridgeman, Walker, Sharma & Smith, 2015) and has been positively correlated to student retention (Devonport & Lane, 2006; Street, 2010). Self-efficacy influences how people feel, think, behave and motivate themselves (Bandura, 1994). Thus, students with a high level of self-efficacy are confident in their own skills in order to succeed. Specifically, students are able to self-motivate, regulate their learning, require minimal guidance, persist in the face of difficulties and tend to have high goal achievement (Broadbent & Poon, 2015).

In relation to studying online and using digital technology, there are three forms of self-efficacy (Alqurashi, 2016):

1. *Computer self-efficacy*: learners' confidence in their capability of using computers and other types of technology;
2. *Internet self-efficacy*: learners' confidence in their capability of using the Internet to seek information;
3. *LMS (Learning Management Systems) self-efficacy*: the level of confidence of learners with LMS and how it affects their performance.

Moreover, other than computer-related self-efficacy, Shen et al. (2013) argue that there are five other dimensions of self-efficacy linked to the online learner, including self-efficacy to.

1. complete an online course,
2. interact socially with classmates,
3. handle tools in a Course Management System (CMS),
4. interact with instructors in an online course, and
5. interact with classmates for academic purposes.

All of the above types of self-efficacy may be important to succeed in an online learning environment, however, research specifically shows that, as long as students have online learning self-efficacy and perceive the usefulness and ease-of-use towards LMSs, student success in online education will be promoted (Alqurashi, 2016; Shen et al., 2013).

11.4 Predictors of Success that Are Unique to Online Psychology Courses

In addition to knowing and understanding the general student characteristics that affect student success in an online mode, it is also important to acknowledge the significance of discipline-specific predictors that are unique to online courses. To illustrate the significance of discipline-specific predictors of online student success, this section will draw on the findings from a research study conducted by Arulkadacham et al. (2020) which examined the predictors of online student success specific to the discipline of Psychology.

To identify discipline-specific predictors of online student success, Arulkadacham et al. (2020) conducted focus groups with online students and instructors from Monash University's two large online Psychology Courses, the Graduate Diploma in Psychology (GDP)—undergraduate level, and the Graduate Diploma of Psychology Advanced (GDPA)—fourth-year level. During the focus groups, online students acknowledged the sensitive nature of the content taught in Psychology in comparison to other disciplines. Despite that students studying psychology online and on-campus receive the same learning content, the students who attend a physical campus have support from peers and readily available on-campus health and well-being services

to help them deal with the sensitive nature of the content, which may arouse past personal trauma. Moreover, online students are different from on-campus students in that they may encounter a perceived isolating nature of studying virtually (Phirangee, 2016). Online courses are often described as self-paced and online students are often described as solo learners. This may create the perception of the course being a lonely experience and when triggered by the learning content offered in the course, they may be faced with the unique challenge and perception of addressing emotional difficulties alone.

The study went on to identify a specific learner characteristic that may be unique to studying in an online Psychology course and promotes student success. The researchers termed this characteristic "*learner content resilience*", to refer to a type of resilience specifically useful to psychology students due to the sensitive nature of the learning content. That is, learner content resilience is a capacity to recover effectively from the learning content that emotionally resonates with one's own emotions and/or life experiences (Arulkadacham et al., 2020).

Consequently, the need for virtual self-care activities (such as mindfulness activities) specifically targeting the development of learner content resilience is not only valuable but necessary to foster student success in online psychology courses. In addition to some of the general predictors of online student success outlined in the literature, online psychology students require additional resources to assist with their success including well-being and self-care resources, and this may indeed be the case for other disciplines taught in an online mode.

11.5 Reflections and Recommendations

It is evident that a "one size fits all" approach should not be taken when designing and implementing online courses. Discipline-specific predictors of student success exist and are relevant and powerful to understanding student success in online education and are consequently important to consider alongside more well-known generic predictors of student success to ultimately provide all students with the opportunity to succeed. It is clear that there are some common predictors of student success that apply to various disciplines, such as engagement, self-regulated learning and motivation. There are also discipline-specific factors that apply to psychology and perhaps also to other disciplines. It will be valuable to consider and research other discipline-specific student success predictors in psychology and other disciplines that can valuably be taken into account by online course designers and instructors.

For the discipline of Psychology (and possibly for other courses), a unique student-related predictor that became evident for student success is learner content resilience, given the sensitive nature of the course material. One way of improving this may be by using trigger warnings throughout course content (Gainsburg & Earl, 2018). Trigger warnings would alert students of sensitive topics coming up, such as content relating to sexual assault or trauma. It is believed that some students may be particularly sensitive to these topics as they may "trigger" or cause some anxiety for students

who have experienced past trauma. Trigger warnings would simply allow students to mentally prepare for potentially triggering content or give them the chance to choose when they want to be exposed to that content.

Another way of improving learner content resilience and student well-being, in general, is to incorporate various well-being resources and virtual self-care activities in online psychology courses (and possibly also in other courses). The next chapter will provide an extensive discussion surrounding this and provide examples of how and why self-care and well-being resources are to be incorporated in online courses more broadly.

It is recommended that all online courses offer self-care and well-being activities, especially online Psychology courses. Disciplines other than psychology may not contain sensitive material and thus do not require students to be content resilient. However, as described earlier, online students are different from on-campus students in that they may encounter a perceived isolating nature of studying virtually. Moreover, online courses are often described as self-paced and online students are often described as solo learners. This may create a perception of the course being a lonely experience. Thus, general practices of self-care for well-being are useful for psychology students (and all online students) to their success as students and to their general success.

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Chapter 12
Transcending "Distance" in Distance Education

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Abstract Online education teaching and learning practice is advancing as it expands education in a way that exceeds the boundaries of time and place. Alongside this, investments are being increasingly made by institutions with the aim of enhancing students' sense of immersion into the learning experience. However, despite best efforts, the distance between the student and the institution during distance education including online education cannot be totally removed. This chapter will explore "distance" and its psychological manifestations in education delivered in the online mode. It will be demonstrated that online teaching and learning practice can be shaped and structured such that an optimal amount of distance between a student and his/her institution can be achieved and, where needed, transcended, to reduce feelings of isolation and increase accountability for learning, both of which can be compromised in this mode of study (Metcalfe & Haugen, 2018). Recommendations are made for the contextualisation of learning and the reduction of the perceived distance between students and each other, students and their teachers, and students and their institutions.

12.1 Introduction

Distance education, off-campus study and online education reflect increasingly common student–institution relationships, whereby the institution comes to the student. Online education[1] is the most recent adaptation of distance/off-campus modes, encapsulating a broader type of flexible study. The evolution and advancement of educational practice in online education has occurred alongside the advancement and use of educational technologies (Taylor, 2001). Technology has allowed educators to overcome the learning barriers that are common in online education, and specifically, those relating to the geographical dispersion and remoteness of

[1] In this chapter, the term online education is used to represent any type of external study, including distance education and off-campus study, as well as online/blended and flexible modes of study.

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students from physical university campuses. Consequently, technology has enabled greater inclusion of diverse student cohorts and, incidentally, has brought new pedagogic approaches (Starr-Glass, 2018). Finally, institutions are bringing the technological advances from the online education mode into the on-campus mode, causing a blurring of boundaries between the online and on-campus experiences (Norton & Cakitaki, 2016). Finally, the expanding use of educational technologies in delivering online education has meant that learning is taking place more often from locations that are further away from the learning source, and hence, with more distant and dissimilar others. The effects of these outcomes include the abstraction and decontextualisation of the learning experience, which, in turn, has an impact on student engagement (Metcalfe & Haugen, 2018). As such, despite the best efforts of technology and educational pedagogies to bring the online student "closer" to the institution, the effects of "distance" in online education are still profound.

12.2 Psychological Distance and How It Applies to Online Education

What constitutes best practice in online education has been a topic of broad interest with the increased popularity of online courses; however, the notion of distance has not been explored. This is despite that learning online, by its very nature, involves a student's interaction with predominantly remote constructs within his/her environment—rendering the notion of learning proximity salient (Bronfenbrenner, 1999). The involvement of both immediate and remote constructs, and associated cognitive and psychological processes during learning is optimal, enabling the acquisition of specific skills from the immediate context, on the one hand, to the application of these skills, on the other hand, to new and novel situations at some point in the future. When students are studying online, they are not only experiencing physical distance from their institution. Psychological distance represents the various ways (beyond just the physical) in which an event or object is removed from an individual's here and now (Trope & Liberman, 2010). Events or objects can be removed or distant from the individual in various ways, and the most relevant of these for the context of online education includes how objects are removed in time, in space, and socially.

Psychological distance, in any form, is positively related to abstraction. Abstraction is a cognitive process that involves identifying distinct objects in the environment as equivalent, or substitutable, for some purpose (Gilead, Trope, & Liberman, 2019). For example, representing a discussion forum, a reading and a lecture as examples of "learning material" is an act of abstraction, as it deems these various methods equivalent, with each of these serving the central purpose of learning. Similarly, construing a written assignment and an exam as different ways of performing academically in a unit of study is an act of abstraction as it identifies the common purpose of quite distinct modes of assessment.

Psychological distance also has differential effects on other forms of cognition (Liberman & Trope, 2008). Specifically, remote interactions between students and their objects of influence, e.g. their learning material, promote not only abstract, but also global and decontextalised representations of these interactions. At this level of distance, only the general gist of the interaction is retained in memory, along with superordinate features. Closer interactions, instead, promote a local, concrete and more contextualised representation of the interaction, such that specific and subordinate features are emphasised and retained. For example, a student studying a prescribed reading or reviewing detailed instructions from a teacher on an assignment is experiencing learning in context and is closely interacting with learning material. This activity in turn promotes a narrower focus of attention on immediate goals and action repertoires, such as closely addressing the requirements of an upcoming assessment. Instead, when a student considers his/her future goals and aspirations, such as looking forward to course completion, they are engaging in a remote interaction with their learning material. Likewise, the student adopts a broader and more general representation of what constitutes learning. In sum, when students sit back and perceive their learning from a distance, questions arise as to the "why" of learning, whereas when immersed within the experience, the "what" and "how" of learning is more salient.

Psychological distance can manifest in time. Temporal distance involves representing information in the past, present or future, either distal or proximal (Trope & Liberman, 2003). Online education is popular for the flexibility it affords to *when* teaching and learning can take place (Bolliger & Martindale, 2004), and therefore, temporal distance is relevant. Specifically, teaching and learning online often occurs outside of regular business hours, on weekends, outside of on-campus semesters, or via the use of pre-prepared/pre-recorded learning material. Similarly, the flexible nature of online learning means that learning material is not always delivered and received in a linear fashion (Cowie & Khoo, 2018), with the onus of what to prioritise and when being left to the students. Finally, online teaching and learning is often organised within modified academic calendars and timetables, sometimes condensed into intense teaching periods (Roddy et al., 2017). In particular, in intense teaching periods, students' study and non-study activities, such as getting started on assessment tasks, and recovering from setbacks such as illness, must occur and be resolved at accelerated rates compared to less intense teaching periods.

Temporal landmarks, such as events that are scheduled or planned in the future, whether personal or public, influence how individuals organise their behaviour and their mental timelines. For instance, the extent to which individuals consider events in the near or distant future influences the extent to which these events are viewed consistently or flexibly (Ledgerwood, Trope, & Chaiken, 2010), and therefore influences decision-making processes around these events (Nussbaum, Liberman, & Trope, 2006). Thinking of events further in the future is shown to promote a broader scope of attention (Henderson, Trope, & Carnevale, 2006), and these events are usually subject to more global influences (Nussbaum et al., 2006). In contrast, events closer to the now promote more detailed-oriented thinking (Henderson et al., 2006) and are usually subject to more context-specific and local influences (Nussbaum et al.,

2006). For example, when students consider the likelihood of obtaining a job immediately after graduation they will attribute this likelihood to the nature of entering the profession if they are far from graduating, as opposed to their final grades, if they are close to graduating. Indeed, individuals are more likely to feel anxious and doubtful of their performance on events that are scheduled for sooner rather than later (Nussbaum et al., 2006).

Social distance, on the other hand, refers to perceptions of distinctness between an individual and a group, or between two groups. Specifically, low levels of abstraction (contextualisation) are associated with interdependent views of the self and others, whereas high levels of abstraction (decontextualisation) are associated with independent views of the self (Spassova & Lee, 2013). Considering the importance of social interaction within online education, both as a support mechanism and as a predictor of academic success (Muilenburg & Berge, 2005; Pascarella & Terenzini, 2005), high and low levels of abstraction may be manipulated to amplify or reduce distance and in turn independent/interdependent learning.

12.3 Psychological Distance and Engagement

Many of the effects of psychological distance on learning are transient and subtle to educators. However, psychological distance may have an impact on online student engagement. Engagement is loosely defined as the degree of interest shown by students towards a topic of learning, which is associated with their interaction with the learning content, their instructor and their peers (Briggs, 2015). Barriers to optimal engagement in online education often include feelings of isolation, reduced motivation and frustration with being separated from the source of learning, i.e. by a computer screen (Briggs, 2015; Metcalfe & Haugen, 2018).

It has been suggested that the physical distance between students and their teachers reduces accountability for learning (Metcalfe & Haugen, 2018). That is, when students are removed physically from one another and lack face-to-face interaction (in person or virtually), their engagement can be hampered. Consequently, the influence of the source of learning on the motivation and preferences for action of a student weaken (Trope & Liberman, 2003). This can be explained by the effects of psychological distance on how objects in one's environment are perceived and evaluated.

Reduced accountability and engagement in online education may be compromised further by the demands placed on students when studying in this mode, including the need to adopt more self-directed (Khiat, 2015; Kirmizi, 2015) and self-regulated (Johnson, 2015; Khiat, 2015) approaches to learning, such as planning, organising, implementing and reflecting on study practices. Interestingly, while distance poses challenges to engagement, it is also associated with an independent self-construal (Spassova & Lee, 2013), rendering the ability for self-directed and self-regulated learning all the more important. Self-regulation is a personal attribute

that differs inherently between students and may moderate the influence of psychological distance on accountability and engagement. The priority is to examine the empirical relationships between psychological distance and engagement in online education, as a first step.

12.4 Reflections and Recommendations for Contextualising Learning in an Already Decontextualized Context

The ability to transcend the inherent distance, psychological and otherwise, of online education, and to move flexibly between high and low levels of abstraction and contextualisation, is important. There are benefits to students being able to contract and expand their level of focus or regulatory scope during their learning where appropriate, and to access different psychological processes and outcomes that each have their distinct strengths. For example, to pass a quiz students may need to focus their attention on specific actions and steps in the here and now, compared to the broader goal of obtaining a degree in the future-a goal which provides meaning and cohesion to life (Emmons, 1992). By default, online education teaching and learning practices may promote higher rather than lower levels of abstraction and may require explicit attempts for contextualisation during the learning process. Exploring ways in which contextualisation can be enhanced, such that distance is transcended, may culminate in better learning engagement.

Interestingly, psychological distance can be manipulated to evoke both abstraction and contextualisation accordingly, for optimal benefit (Kalkstein et al., 2016). The following recommendations for practice have been put together drawing inferences between what is currently known about learning and engagement in online education:

1. **Create learning environments that provide meaning to the why and how of learning**
   Common practice when developing or creating online courses involves the highly efficient duplication and "uploading" of on-campus content online. As such, online teaching and learning material focusses on the *what* students need to learn, such that online learning management systems become repositories of information in the form of a series of links to readings, lectures, videos and assessments, albeit equivalent to the on-campus content (Garivaldis, McKenzie, & Mundy, 2020; McPhee & Söderström, 2012). However, this practice leaves little capacity for questions around intangibles such as the *how* and *why* of learning to be addressed.
   Consider creating meaningful learning environments, by creating and organising learning material within online workbooks. These workbooks could emulate the on-campus lecture experience using a narrative that binds the learning material together and provides "learners with an understanding of *what* has to be done, *how* it has to be done, *why* it has to be done, and *when* learning goals have been reached" (Starr-Glass, 2018, p. 253). Learning materials that "speak

to" the learner promote the contextualisation of learning and, hence, increase immersion (Ledgerwood et al., 2015), i.e. feelings of being surrounded by the immediate learning environment, and separated from the wider physical environment. With greater immersion comes greater learning engagement (Lessiter, Freeman, Keogh, & Davidoff, 2001), perhaps due to feelings of closeness to the learning experience.

2. **Offer flexible real-time teaching and learning opportunities**
   The flexible nature of online study means that more and more students are utilising this option to upskill and retrain (Allen & Seaman, 2017). Studying flexibly involves a different and more creative use of time that accommodates the needs of individual learners over the needs of groups. For example, lecture material is often pre-recorded—to be viewed online in the student's own time. As such, with flexibility comes temporal distancing, manifesting between *when* learning is being imparted, and *when* it is being received.
   Therefore, it is no surprise that best practice in online teaching involves offering opportunities for synchronous interactions or activities between students and their instructors. Synchronous activities, often in the form of online classes, provide a communication channel where students can have their questions and concerns addressed in real time, and where instructors can manage planned as well as emergent online student needs effectively (Cowie & Khoo, 2018). Communication and interaction in real time decreases psychological distance across all of spatial, temporal and social distance dimensions and improves contextualisation of the learning experience, as well as student–student interaction and learning interdependence.
3. **Address short-term and long-term learning goals**
   Temporal distance can be manipulated through learning goals. Short-term and long-term goals differ in their level of abstraction, such that short-term goals are less abstract than long-term goals, as they dictate how actions or processes are to be carried out. Long-term goals, however, have a higher level of abstraction, providing direction and guidance with purposes and outcomes in mind (Emmons, 1992), and with built-in flexibility as to the how these outcomes will be achieved. Best practice in online education should involve addressing both short-term (concrete) and long-term (abstract) student goals to help exercise both a narrow focus of attention, deliberate and targeted behaviour and expediency in the achievement of these goals, and a broader scope of attention, enabling students to ascribe meaning and purpose to their behaviour (Little, 1989).
4. **Provide channels for student–instructor and student–student communication**
   There is an increasingly wide range of online courses becoming available, such that learners are more and more learning flexibly, albeit alone. Online student–instructor and student–student communication is often asynchronous; discussion boards, pre-recorded lectures and self-directed learning tasks replace the face-to-face discussions that would occur in traditional classrooms (Arkoful & Abaidoo, 2015; Martin, Wang, & Sadaf, 2018). This means that there are diminishing opportunities for spontaneous interaction between instructors and

students online, a factor that would otherwise help build relationships. In addition, the greater the social distance between educators and students, the greater the reliance on implicit forms of learning (Kalkstein et al., 2016).

Similarly, online instructors must communicate via less-efficient channels, such as email, rather than through face-to-face conversation. The time it takes instructors to engage in textual communication with students is greater in online education than in-person feedback (Andrews Graham, 2019)—a factor that may jeopardise the timeliness with which instructors answer student questions and provide feedback, not only exacerbating the effects of temporal distance, but also compromising the attention given to students (Eskey & Schulte, 2010; Martin et al., 2018). Finally, online textual communication requires a reliance solely on verbal cues in order to convey inter-personal affect, whereas much of this is done through non-verbal cues in face-to-face conversations (Walther, Loh, & Granka, 2005).

Students studying online have less access to learning peers than students studying on-campus. The lack of student–student interaction is the single most important barrier to studying effectively online (Muilenburg & Berge, 2005). Creating learning material that cultivates social relationships improves student engagement (Oomen-Early & Murphy, 2009), learning satisfaction (Briggs, 2015) and well-being (Akcaoglu & Bowman, 2016). Social interaction need not remain a responsibility of the student.

5. **Personalise the learning experience**

The personalisation of the learning experience enables the shortening of psychological distance between a learner and the teaching that the learner receives. Personalised learning involves the customisation of education (Hargreaves, 2005), such as setting the curriculum to address the diversity of student needs (Prain et al., 2013), and nurturing the unique talents of students and the provision of individual support (Campbell, Robinson, Neelands, Hewston, & Massoli, 2007). As such, students who receive personalised learning are engaged in, show responsibility for and are often involved in the co-design of their learning and teaching experience (Metcalfe & Haugen, 2018; Prain et al., 2013).

Even in the online mode, despite the lack of face-to-face interaction, personalisation can take many forms, from the provision of personalised feedback on assessment, responding to individual posts in discussion forums, using names to address students, using less formal language in correspondence, establishing expectations around contact hours and contact preferences as well as response times (Briggs, 2015), and providing timely feedback to individual students (Metcalfe & Haugen, 2018).

Depending on the level of abstraction of the feedback, personalised feedback is more or less effective. For example, research has shown that students prefer detailed feedback (personalised) concerning specific elements of the submitted work (contextualised) when it is favourable, with the main purpose of self-esteem protection (Freitas, Salovey, & Liberman, 2001). As such, the personalisation of feedback provided to students not only influences students' learning, but also students' emotional responses, with greater personalisation requiring greater positive framing.

The concept of personalisation can also apply to teaching practice. Personalised teaching may involve the use of the identity of individual teachers, their experiences and expertise. This may occur as simply as through the sharing of teacher information, with students, about personal interests and hobbies, career trajectories, and academic experience (Metcalfe & Haugen, 2018). In doing so, online instructors need to be "approachable, caring, responsive, and willing to take the time to connect with students", all of which demonstrate instructor presence and engagement, and providing a supportive learning environment for student presence and engagement (Metcalfe & Haugen, 2018, p. 192).

12.5 Conclusion

This chapter has discussed the value and benefit of contextualising the online learning experience, to enable greater student engagement and meaningful interaction with the learning material, each other and the institution. The chapter has also demonstrated that a variety of levels of distance are needed, to provide flexibility to students.

Variability in mental representations of learning, i.e. a variety of levels of psychological distance, will promote variability in the way students themselves apply learning. In relation to the distant future, decontextualized or abstract representations of learning render a given object or event applicable to a variety of people and across a variety of situations (Kalkstein et al., 2016), and may enable learning to be transferred to other contexts, new and less familiar, to the here and now. Alternatively, in relation to the near future, contextualisation should encourage students to apply context-specific rather than general principles, and hence, warrant greater flexibility in responding to current situations (Ledgerwood et al., 2010).

A further benefit of contextualising learning is that it increases the chances that the learning will be directly applied to individuals' own situations. For example, students' learning step-by-step on how to conduct a specific statistical procedure increases the chances that this learning will be applied to situations when the procedure needs to be replicated. However, not all opportunities for applying learning are contextually reproducible and instead may be context bound. The process of decontextualisation of the learning content may overcome this barrier. For example, teaching students about the theoretical underpinnings of a statistical procedure may better equip them with the ability to modify the procedure in new and novel contexts, as needed. As such, despite the inherent distance in online education students can be given the opportunity to engage in the abstraction of the learning experience, to more readily apply it to their own situation (Kalkstein et al, 2016), as well as the contextualisation of the learning experience, to reap immediate online study success.

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Chapter 13
Sticks and Stones? Recognising and Optimally Responding to 'eRage'—A Growing Educational Challenge

Lauren Shaw and Alicia Barker

Abstract Demand for online education, which provides students with the ability to study around their work and family commitments, has increased considerably in recent years and is expected to grow further. However, there are key differences between online and on-campus education that give rise to unique and complex challenges for online educators. One potential challenge is apparent greater volatility of online students that can see online educators experience greater levels of instructional dissent. We have termed this phenomenon 'eRage'—students communicating electronically with staff in a rude, antisocial manner to express disagreement or contradictory opinions regarding classroom issues. This chapter will examine the challenges of online education that could contribute to eRage; briefly examine the literature pertaining to instructional dissent and provide recommendations for online educators to manage this somewhat overlooked and clandestine issue moving forward.

13.1 Online Education: The Challenges

Online education allows for unparalleled flexibility and accessibility, meaning that geographical boundaries and time commitments that may prevent students from studying on-campus can be mitigated by studying online (Naidu, 2019; Norton & Cakitaki, 2016; Norton, Cherastidham, & Mackey, 2018; Norton & Cherastidtham, 2014). Online education enrolments have outnumbered traditional face-to-face learning in the United States since 2012 (Allen & Seaman, 2014; Seaman, Allen, & Seaman, 2018) and similar growth has been reported globally (Palvia et al., 2018). In Australia, recent changes to funding policies that allow public universities to invest more in online learning mean that online enrolments are expected to increase in the coming years (Norton et al., 2018).

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Online educators will be pleased to learn that when it comes to student academic performance, evidence indicates that online education is equivalent to on-campus study (Magagula & Ngwenya, 2004; McPhee, Anderson, & Söderström, 2012). However, the available, albeit limited, evidence also shows that levels of student satisfaction appear to be lower in online education, with a recent qualitative study of Australian students indicating that online students believe they work harder but receive fewer resources and support than their on-campus counterparts, despite paying equivalent tuition fees (Lyke & Frank, 2012; Ragusa & Crampton, 2017). This apparent difference in student satisfaction based on study mode could be attributed to fewer opportunities in online education for real-time interaction, as a plethora of evidence indicates that synchronous interactions between instructors and students are associated with enhanced student satisfaction and improved learning outcomes (Arkoful & Abaidoo, 2015; Jaggars & Xu, 2016; Martin, Wang, & Sadaf, 2018; Swaggerty & Broemmel, 2017; VaLloyd, Byrne, & McCoy, 2012). In online courses, student–instructor communication is primarily asynchronous, utilising email, discussion boards, pre-recorded lectures and self-directed learning tasks in place of face-to-face discussions that would occur more often in traditional classrooms. While such methods provide the flexibility that online students need to integrate study around their other commitments, they also impede opportunities for spontaneous interaction between instructors and students that help to build relationships and clarify course or assignment expectations.

To that end, a key challenge in online education is how to communicate effectively with students using asynchronous methods, which are primarily written forms of communication. Perhaps stemming from the flexibility with which online education courses are advertised as providing, and the instantaneous nature of email, online instructors report that they perceive a greater pressure to be available and at students' beck and call for an immediate response to their queries (Hailey, Grant-Davie, & Hult, 2001; Roddy et al., 2017). Arguably, on-campus educators may not experience the need for constant email connection that online instructors do, because lecture, class times and office hours are set, and it is easier to arrange face-to-face meetings to discuss more complex issues. This is key, as answering questions, providing feedback and resolving grievances in a timely fashion have been shown to positively predict student ratings of instructor presence, engagement, learning and student success (Eskey & Schulte, 2010; Martin et al., 2018; Ragusa & Crampton, 2017). In online education, email correspondence can be challenging for more multifaceted issues and back-and-forth dialogues. In short, it takes longer to write something than it does to say something, meaning that primarily relying on written communication requires a greater time investment for online instructors (Andrews-Graham, 2019; Sword, 2012).

Likewise, tone, meaning and emotion can be difficult to both convey and infer in written communication (Walther, Loh, & Granka, 2005). As such, misinterpretations of written communication are more likely to occur in online education, and unlike on-campus education, online education provides fewer timely opportunities to clarify misunderstandings. This heightened potential for misinterpretation, coupled with asynchronicity and the greater anonymity that online students are afforded

can see online educators subjected to angry, rude and aggressive communication from students: a phenomenon we have termed 'eRage', but is more formally termed instructional dissent.

13.2 Instructional Dissent in Online Education: 'eRage'

Instructional dissent has its origins in Kassing's (1997) conceptualisation of organisational dissent, which refers to employees disputing or voicing conflicting opinions regarding organisational issues. Broadly speaking, organisational dissent is said to occur when employees or members feel excluded or distant from their organisation (Kassing, 1997). Applying concepts of organisational dissent to the university environment, Goodboy (2011a, 2011b) proposed that instructional dissent occurs when students dispute or voice conflicting opinions regarding classroom or university issues, and suggested three discrete forms: expressive, vengeful and rhetorical dissent. We will explore each of these types of dissent now, with some examples to illustrate. All examples, including any names used, are completely fictional; however, they are based on common emails the first author received while working as a course convenor a fully online psychology course. First, expressive dissent refers to students venting their dissatisfaction regarding a classroom issue, such as an instructor's teaching style or an awarded grade. The primary goal of expressive dissent is to regulate negative emotion by seeking social support from others, rather than to enact a change in their course (Goodboy, 2011a, 2011b). For example, students who make a complaint about their grade to make themselves feel better would be engaging in expressive dissent. Expressive dissent is shown in the following example, where a student is venting their dissatisfaction with a grade they received:

> I've just received my grade for Assignment 1 and I am EXTREMELY disappointed. I spent hours and hours; days and days working on this assignment, but I only received 60%. The marker seemed to just pick on everything and was really negative. My friend managed to do the same assignment in 5 hours and got a HD. FIVE HOURS?? How is this fair? This has caused me SO much stress and anxiety. For my friend to get more than I did when I spent longer and worked harder is completely unfair and unjust.

Second, vengeful dissent refers to a particularly hostile-aggressive type of dissent reflecting student retaliation or revenge, intended to cause harm to an instructor. For example, students who write emails to their instructor threatening to have them fired, or otherwise ruin their career for not accepting their late assignment, would constitute engaging in vengeful dissent. Vengeful dissent is shown in the example below, where the student goes beyond expressing disappointment with their mark, to insulting and threatening the marker:

> I'm writing about the marks for assignment 2 because mine is completely unfair. I am a HD student, yet somehow, my marker, Kelly thinks my work on this assignment is only worth 62%. The comments were extremely negative. She may have a PhD, but given the low mark I received on this assignment and the comments she made, it seems Kelly does not have a good

> understanding of the concepts I proposed in the assignment. I request that my assignment is remarked immediately by someone who does have an appropriate level of understanding. Moreover, I will be making a formal complaint about Kelly's marking to the Deputy Dean of Education and requesting that she no longer teach in this unit.

While expressive dissent may appear to be the more innocuous form of dissent, akin to venting negative emotions, there is compelling evidence from the anger and aggression literature demonstrating that venting negative emotions exacerbates them and increases aggressive behaviour (Bushman, 2002; Koole, 2009). Reflecting this, a study by Frisby, Goodboy, and Buckner (2015) of undergraduate students found that engaging in expressive dissent positively predicted engaging in vengeful dissent, suggesting expressive dissent may be used to rally support from other students before engaging in vengeful dissent against their instructor.

Finally, rhetorical dissent refers to complaints designed to invoke change or convince an instructor of their perceived wrongdoing, for example, students voicing their objections to a classroom policy they perceive as unfair, with the intention that the policy will change. While rhetorical dissent can often be encouraged as a positive expression of critical thinking in academic environments (Hornsey, Jetten, McAuliffe, & Hogg, 2006; Jetten & Hornsey, 2014), the issue lays in how the dissent is conveyed: grievances that are expressed in a respectful, reasoned and polite manner should be viewed as a positive contribution by teaching staff. The issue for educators (online or on-campus) arises when the message is delivered rudely and makes unreasonable demands. Anecdotally, online educators report experiencing the latter more frequently than their on-campus counterparts (Hailey et al., 2001). Rhetorical dissent is shown in the following example, where a student has written to advise the teaching team about minor errors in practice quizzes. While the student's issue with minor errors in the quizzes is a legitimate one, the request makes unreasonable demands (e.g. "fix this issue immediately") and threatens the teaching team (e.g. "I'll take this matter further"):

> I'm writing to bring the copious number of typos, spelling mistakes and grammatical errors in the practice quizzes to your attention. This is extremely disappointing to see and makes it incredibly difficult to study. How do you expect students to learn when they are too busy trying to figure out if the typo is a trick question or somehow intentional, or just a simple mistake? For the amount of money that I'm paying for this course, this just isn't acceptable. Please address this issue immediately or I will be forced to take this matter higher.

13.3 eRage: Why Does It Occur?

While no formal studies on the prevalence of eRage in online education have been conducted, anecdotal reports suggest that online educators believe it occurs more frequently online, and that they spend more time dealing with argumentative, volatile and rude correspondence from students. For example, Hailey et al. (2001) offered one of the earliest reports of heightened instructional dissent in online education, provided during a time where online education would have truly been in its infancy.

Hailey and colleagues highlighted that student dissent towards instructors was a greater challenge in online learning, is more likely to escalate and is more difficult to manage than on-campus environments. Similar sentiments were offered by Peoples-Halio (2004), claiming that online instructors "face a minefield" of dissent each time they open their computer. Peoples-Halio (2004) observed that female students sent more personal, long emails requiring reassurance from instructors, while male students tended to be more combative, often sending angry emails to make changes to the course to suit their personal needs.

Hailey and colleagues (2001) considered some of the factors unique to the online environment that could contribute to the perceived greater instructional dissent in online education. First, due to greater synchronous communication, students in traditional classrooms are provided more informal opportunities to communicate and, therefore, air grievances with their instructors. As such, complaints tend to stay within their class or department and are resolved (Hailey et al., 2001). In online courses, not only is communication generally asynchronous, but the instructor is seen as just one of many authority figures that complaints can be directed towards. With just a few quick Google searches done in a heated moment, an outraged student can find the names of administrators, department heads and other higher-ups, and press "send" on an angry complaint, cc'ing them all in. As such, what may have otherwise been a minor complaint becomes blown out of proportion and more time-consuming for all involved, potentially damaging the instructor's, or student's, reputation along the way.

Factors such as increased anonymity (Barlett, Gentile, & Chew, 2016; Tsikerdekis, 2012) and the online disinhibition effect (Casale, Fiovaranti, & Caplan, 2015; Suler, 2004) have been positively linked to aggressive or negative forms dissent in other online communities (Barlett et al., 2016; Beatty, Valencic, Rudd, & Dobos, 1999; Rösner, 2016; Xu, Xu, & Li, 2016). In online education, both students and instructors have greater levels of anonymity. For online students, this anonymity may make them feel less inhibited about engaging in negative or combative forms of dissent towards their instructors: after all, they do not need to face their instructor in-person at a lecture or tutorial after sending the email. For instructors, the greater anonymity they have can see them viewed as impersonal and faceless by students, which may make students feel even less restrained about dissent. Indeed, after receiving a particularly heated email, the first author of this chapter once remarked to colleagues if the student who wrote the email was aware that there was a real, human person on the end of it. While the factors described above could certainly contribute to eRage in online education, they do not explain what seems to make online students angrier in the first place. To explore this, the authors suggest examining the concept of classroom justice.

13.4 eRage: Classroom Justice?

Within the organisational psychology literature, organisational dissent is related to perceptions of organisational justice: how fairly employees perceive they are treated in the workplace. Specifically, distributive justice refers to the perceived fairness of outcomes, and procedural justice refers to the perceived fairness of the processes used to arrive at the outcomes. Drawing on these concepts, Chory-Assad and Paulsel (2004; Chory, 2007) argued that antisocial behaviour from students, like instructional dissent, may be driven by justice perceptions. Accordingly, the authors coined the term classroom justice to describe perceptions of fairness concerning outcomes or processes that occur in educational environments. In educational settings, procedural justice perceptions refer to perceptions of the fairness of the systems or processes used to arrive at that outcome, such as assignment submission policies, while distributive justice refers to the fairness of outcomes received (i.e. grades) (Chory-Assad, 2002).

Research on the role of classroom justice perceptions in instructional dissent indicates that while both distributive and procedural justice are associated with dissent, procedural justice appears to be key. For instance, while evidence about exactly what educational systems and procedures students perceive as just or unjust is scant, student perceptions of procedural justice have been found to improve when grades were allocated using procedures described in the syllabus (Tata, 1999) and when based on multiple grading opportunities rather than one (Tyler & Caine, 1981).

Evidence of procedural justice perceptions in predicting dissent was also reported by Goodboy and Bolkan (2009), who found that instructional dissent was negatively associated with perceptions of procedural justice, and specifically, perceived wrongdoing by an instructor. Mirroring these findings, the majority of antecedents of dissent represented low perceptions of procedural justice. These included perceived instructor wrongdoings such as unfair testing/assignments (22.0%), unfair grading practices or grading mistakes (20.3%), classroom policies (9.8%) and violating the syllabus (5.7%) (Goodboy, 2011b). Similarly, in a qualitative study of students' reactions to perceptions of classroom justice, Horan and Myers (2009) found that students were most likely to respond to perceived injustice by dissenting, with most of the dissent being directed towards the students' instructor.

Chory-Assad (Chory-Assad, 2002; Chory-Assad & Paulsel, 2004; Chory, 2007) examined the association between student justice perceptions and facets of instructional dissent, including hostility, indirect interpersonal aggression and resistance towards their instructors. Taken together, their findings indicate that distributive and procedural justice were negatively associated with antisocial student communication, with only procedural justice demonstrating predictive utility. Other studies have shown that procedural justice perceptions are negatively correlated with expressive instructional dissent, and that while students reported procedural justice violations, such as strict or unfair grading policies most frequently, the most potent emotional reactions reflected combined violations of procedural-distributive justice (Bolkan & Goodboy, 2013; Chory-Assad, Horan, Carton, & Houser, 2013; Goodboy, 2011a).

While this evidence is compelling, an important caveat is noted: all of it has been garnered from on-campus learning environments. To the best of the authors' knowledge, no studies have examined justice perceptions in instructional dissent in online education. This lack of research is surprising given that anecdotal reports of greater levels of 'eRage' in online education have been reported as far back as 2001. It is possible that, if online students do indeed engage in instructional dissent more frequently and intensely than their on-campus counterparts, low perceptions of procedural justice experienced by online students may be exacerbated by the asynchronous nature of online courses. Specifically, there are fewer opportunities for instructors to clarify and explain the reasoning behind procedures, such as late submission policies, grading procedures or feedback systems (Arkoful & Abaidoo, 2015). Further, because online students have fewer opportunities to interact spontaneously and therefore engage in expressive dissent with their fellow students, they may choose to dissent (expressive or otherwise) directly to their instructor. Moreover, the delay inherent in email responding and the challenges involved in having complex dialogues via email could see students feel that their opinions have not been considered in the policy decisions, leading to lower perceptions of procedural justice (Leventhal, 1980).

13.5 Reflections and Recommendations

eRage in online education is an overlooked, somewhat taboo, but important issue for online educators. While this chapter hopes to bring the issue to the attention of the online education community, the authors note that eRage is an incredibly complex issue and the points raised in this chapter are merely the tip of the eRage iceberg. Nevertheless, the famous adage "sticks and stones may break my bones, but words will never hurt me" implies that hurtful, insulting words cannot harm an individual; however, in the context of online education, this view minimises the effect that eRage can have on instructors.

For online educators, de-escalating dissent that is charged with negative emotions can be emotionally taxing (Peoples-Halio, 2004), and there is evidence that those dealing with such correspondence online are more likely to experience anxiety, depression and social difficulties (Campbell, Spears, Slee, Butler, & Kift, 2012; Heischman, Nagy, & Settler, 2019; Hinduja & Patchin, 2008). Moreover, heightened levels of burnout are a critical and increasingly recognised issue in academia in general, and studies have found that instructional dissent can contribute to burnout. For instance, Frisby and colleagues (2015) found that expressive dissent from students was positively related to emotional exhaustion in instructors, while experiencing vengeful dissent from students was negatively related to organisational commitment. Further, both expressive and vengeful dissent from students were negatively related to teaching satisfaction in instructors (Frisby et al., 2015). Moreover, the immense time–pressure that academic staff experience is well documented in the

literature, but for online instructors, responding to dissenting emails adds to the pressure and takes time away from implementing course improvements (Peoples-Halio, 2004). As such, reducing and managing eRage is important and the authors propose three key recommendations moving forward.

1. **More research**. First and foremost, more research is needed to explore the issue of eRage in online education, and two specific avenues for research are suggested. First, conducting formal, methodologically sound studies examining online educators' experiences of instructional dissent from students. As we have described, while eRage appears to be a well-known, yet somewhat unspoken aspect of online education, reports of it being a greater issue in online education are, at this stage, anecdotal. Providing empirically derived evidence of greater instructional dissent in online education will help to provide a sound basis for a body of research to develop and evolve. Second, research could examine the role of student justice perceptions in predicting instructional dissent in online education and compare them to on-campus education. While there has been a considerable amount of research examining the role of classroom justice perceptions in accounting for instructional dissent in on-campus education, these concepts have not yet been explored within online education. However, as we have highlighted, there are facets unique to the online environment that could exacerbate poor perceptions of procedural justice and promote instructional dissent in response to it.
2. **Enhance transparency regarding academic procedures**. Although more research is most certainly needed, extrapolating the evidence from on-campus education, improving student perceptions of procedural justice in online education may contribute to a reduction in eRage. Not only have perceptions of procedural justice been found to be a key predictor of instructional dissent, procedural justice issues are arguably simpler and more realistic for educators to address. For instance, changing a student's grade to increase perceptions of distributive justice would not be academically viable, especially if the student did not objectively deserve a higher grade. However, improving the transparency of, and rationale for, classroom procedures and policies, such as marking rubrics and late submission policies, are likely to have a greater impact on the perceived fairness of grades and in turn, reduce instructional dissent.
3. **Increase opportunities for synchronous communication and reduce staff anonymity**. Asynchronous learning provides the flexibility that students who choose to study online are drawn to, so it would be fatuous to suggest that online education move away from these methods. However, online educators should also explore ways to increase synchronous communication in learning. This may include having a greater number of weekly real-time online classes; increasing, or indeed implementing virtual office hours; and having more virtual one-on-one meetings or consultations with students to clarify their questions or discuss grievances or concerns. Increasing the opportunities for synchronous communication will decrease reliance on written communication that can be misinterpreted, and is generally timelier and more efficient. Further, implementing greater

opportunities for synchronous methods of communication may also reduce the relative anonymity of staff, and thus may help to reduce eRage by reminding students that there is a real person receiving their emails.

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Chapter 14
The Authentic Online Teacher—Practical Insights from Rogers' Person-Centred Approach

Christopher J. Holt

Abstract In a rapidly changing world, good education should foster curiosity, absorption, adaptability, and lifelong learning. In online education, authenticity is likely one important attribute that can help facilitate this higher form of learning. In this chapter, I briefly discuss the conceptualisation of authenticity, highlighting issues that may have thwarted research in this area. This chapter will also attempt to highlight the importance of authenticity and suggest that it is one of the basic elements of good teaching, particularly online teaching, that should not be forgotten as education moves forward into this new frontier. Lastly, this chapter will discuss the challenges of authenticity in online education and suggest ways in which it can be enhanced.

14.1 Introduction

> The only person who is educated is the person who has learned how to learn
>
> (Rogers & Freiberg, 1994, p. 152)

We live in a world of rapid change, increased complexity, and uncertainty (Barnett, 2006). Emerging technologies such as robotics, artificial intelligence, virtual/augmented reality, cloud computing, and online Learning Management Systems have and will continue to change the way we live and the way in which we work. Of the jobs that today's learners will likely undertake in 2030, 85% of these do not currently exist (Institute for the Future for Dell Technologies, 2017). To meet this uncertainty and pace of change, good education should not just involve the transmission of static information; it should foster lifelong learning (Candy, 2000). To have a successful lifelong career, education should create graduates who can adapt and respond to change quickly (Su, 2014). The suggestion that learning should go beyond the transmission of static information is not new. Carl Rogers, one of

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the founders of humanistic psychology, acknowledged the need to better facilitate learning as what is taught to students will either be modified or become outdated by the time they commence work (Rogers & Freiberg, 1994). He suggested that the goal of education should be to create students that can adapt, change, and become lifelong learners.

Learning that has no personal meaning involves the mind only; it takes place from the neck up. Learning that fosters insatiable curiosity and absorption, needs to involve feelings and personal meaning; it should involve the whole person (Rogers & Freiberg, 1994). So how is this type of learning facilitated, including in online learning environments? This chapter will discuss one likely important, yet under researched attribute, that can enable this experiential learning—authenticity.

14.2 What Is Authenticity?

The concept of authenticity is not new but is still rather vague and ill-defined, with definitions often touching on different aspects of authenticity (Harter, 2002; Medlock, 2014). Broadly speaking, to be authentic is to act in accordance with our true selves (Medlock, 2014; Schlegel & Hicks, 2011; Smallenbroek, Zelenski, & Whelan, 2017). Smallenbroek et al. (2017) suggest that authenticity should be conceptualised as either a state or trait, where short-term experiences of self-relevant activity refer to states, and stable patterns of cognition that allow for frequent authentic behaviour refer to trait authenticity.

Others have viewed authenticity as a multidimensional construct. For example, Medlock (2014) suggests that authenticity is comprised of "(a) congruence of internal emotional states, actual conduct, stated intentions, commitments, and self-representations; (b) open, non-defensive awareness of the richness and depth of experience; (c) presence and full engagement in the here and now flow of experience; (d) conscious, autonomous choice; (e) a growth mindset with an orientation towards developing potential and expanding possibilities; (f) responsibility and resolute commitment; and (g) a sense of coherence of meaning and purpose" (p. 52). Kreber, Klampfleitner, Mccune, Bayne, and Knottenbelt (2007) in a comparative review of conceptions of authenticity in educational and philosophical literature suggested that authenticity in teaching includes being genuine, self-aware, being defined by one's self, incorporating aspects of oneself into interactions, and critical reflection on not just self but also others, relationships, context, and what matters most to learners. Granted these are just a few examples taken from the literature but from the above we can start to appreciate that conceptualisations incorporate multiple and varying aspects. This lack of consensus can help explain why research on authenticity, and its application in education, is sparse. Without a sound conceptual understanding of authenticity, it is difficult to argue for its educational and online educational importance, and to identify practical educational applications (Kreber et al., 2007).

Arguably, the clearest definition of authenticity has come out of Carl Rogers' person-centred approach to psychotherapy, which involves focusing on the person's subjective view of the world (Wood, Linley, Maltby, Baliousis, & Joseph, 2008). Authenticity in this context has been conceptualised as involving consistency between actual experience, conscious awareness, and behaviour (Barrett-Lennard, 1998). Authenticity is said to firstly stem from a close match between one's actual experience and conscious perceptions of their experience, which is a necessary antecedent for congruence between awareness and behaviour. In other words, to be authentic is to behave and express emotions that are consistent with perceptions of physiological states, emotions, and thoughts (Wood et al., 2008). Although Rogers' approach was initially developed for counselling and psychotherapy, it was later realised that it could be usefully applied to other contexts, including education (Rogers & Freiberg, 1994). It is this conceptualisation of authenticity that will be the focus of this chapter as it aligns with the central understanding of acting in accordance with self that seems to run through most definitions.

To provide a lived example of authenticity, early in my career, I recall a supervision session with a research student where she revealed that an ethics committee had queried an aspect of our application that they had not queried in an almost identical application submitted by another student at the same time. Without thinking too much and given the time pressure, I responded by slamming my hand on the table, shaking my head, and muttering some profanities that I would not have normally done during a supervision session. The student laughed, immediately sat up, and said, "that is the first time I have seen the real you!". This "realness" changed the session, in that the student was more receptive, attentive, and engaged. Rogers (Rogers & Freiberg, 1994) suggests that when a teacher is real, meaning they are aware of their feelings, lives them, and communicates them (if appropriate), learning can be enhanced. In the example provided above, the student could accept and relate to my feelings of frustration, she saw me as a person, rather than simply a source of information and it was this act of realness that transformed the session into one of higher engagement.

Although authenticity is typically seen as a positive quality, it is acknowledged that being authentic in certain situations can be problematic (Harter, 2002; Rogers & Freiberg, 1994). For example, being honest in expressing negative feelings and making judgements towards another can lead to resentment and anger. In these instances, it may not be appropriate to express these feelings, particularly if it jeopardizes the relationship (Harter, 2002). To help prevent these negative consequences, Rogers also mentions the importance of expressing one's own inner feelings purely as their own, rather than projecting them onto others or turning them into judgements, which can be difficult and requires greater self-awareness (Rogers & Freiberg, 1994).

Other important attitudinal qualities from the person-centred approach that are said to facilitate growth and learning include acceptance (i.e. realising that the learner is a person with feelings and being accepting of these) and empathic understanding. Although these other qualities are important, it is authenticity, a sharing of one's own true inner feelings, that is considered the most basic and important quality for good teaching (Rogers & Freiberg, 1994). It is also acknowledged that of the three attitudinal qualities, feeling empathic and accepting of students may not always be

possible, for example, it is likely difficult for a teacher to be accepting and empathic towards a difficult student, but being real/authentic in these situations can help lead to change and is more beneficial than pretending to care, which can lead to alienation (Rogers & Freiberg, 1994).

14.3 Benefits of Authenticity

In general, authenticity has long been described as a positive attribute, contributing to psychological well-being (Schlegel & Hicks, 2011). Smallenbroek et al. (2017) suggested that authenticity is a core aspect of eudaimonic well-being, which is when one's activities align with their inner values and they become fully engaged (Waterman, 1993). According to humanistic psychologists, authenticity is suggested to be a central component of Seligman's authentic happiness construct (Seligman, 2002), in which the building of unique talents and strengths, considered aspects of authenticity, help one to live a meaningful and purposeful life (Medlock, 2012). Empirically, research has found positive associations with authenticity and well-being (Wood et al., 2008), self-esteem (Goldman & Kernis, 2002; Harter, Marold, Whitesell, & Cobbs, 1996), positive affect and hope (Harter et al., 1996), and life satisfaction (Goldman & Kernis, 2002). However, there is a lack of causal evidence to support suggestions that authenticity is the precursor to positive outcomes like well-being (Wood et al., 2008) and often conceptualisations of authenticity have differed across studies, making overall interpretations of the literature difficult.

Although authenticity has largely been neglected in teaching (Cranton & Carusetta, 2004), it is considered to make students more aware, content, empowered, socially connected, and also more likely to engage in purposeful action (Kreber et al., 2007). In a meta-analysis of 119 studies from 1948 to 2004, Cornelius-White (2007) found that person-centred characteristics (e.g. authenticity, acceptance, and empathic understanding) were correlated with a number of cognitive (e.g. grades), affective (e.g. motivation), and behavioural (e.g. attendance) student outcomes and when combined as composite, these person-centred characteristics had an overall average correlation with student outcomes that was larger ($r = 0.31$) than other educational innovations. Of the person-centred characteristics, authenticity produced only a small correlation ($r = 0.14$) but it was suggested that this was due to the difficulty in measuring this elusive construct and it may be better indirectly measured through a person-centred composite. Issues with the measurement of authenticity have also been shared by other researchers, particularly as notions of the true self are reliant on interpretations, which may not be accurate (Medlock, 2012).

Aside from the potential measurement issues, another limitation of the research on authenticity in education is that most of it is correlational and therefore evidence of causality is lacking. It is likely that the direction may also exist in reverse where a teacher is more likely to behave in an authentic way due to student behaviour and other student outcomes (Cornelius-White, 2007). Rogers did acknowledge the possibility of reciprocal effects in his original theory, suggesting that the relationship

between attitudinal qualities like authenticity and well-being could be bidirectional and may produce upward spiral effects (Rogers, 1989). Possible reciprocal effects would likely positively transform the interpersonal relationship and, in turn, the learning and teaching experience.

14.4 Reflections and Recommendations

There are a number of potential factors that can reduce authentic teaching in higher education, which occur at the institutional (e.g. lecture duration), structural (e.g. enrolment numbers, class configuration, required textbooks), policy (e.g. teaching guidelines) and social level (e.g. colleagues and student expectations; Hunt, 2006). Although a necessary requirement to improve student outcomes (e.g. experience and consistency etc.), these factors do not consider teachers' individual differences, teaching styles, preferences, and values, often adopting a one-size-fits-all approach (Cranton & Carusetta, 2004). Lecturers, to be authentic, have to negotiate among these factors and their teaching style (Hunt, 2006).

To help enhance teacher authenticity, self-determination theory (SDT) can be usefully applied to educational contexts, particularly as it considers the importance of individual factors, which may not always receive the necessary attention as stated above. According to SDT, when actions are either self-determined or aspects of the self can be integrated into extrinsically motivated factors, behaviour becomes authentic. SDT proposes three psychological needs of autonomy, relatedness (e.g. interpersonal relationships), and competency, which if met, are conducive to authenticity and well-being (Ryan & Deci, 2000). Institutions and teachers should be mindful of these psychological needs and consider ways in which they can be fostered to facilitate authentic teaching.

In an online environment, it is important to acknowledge likely additional constraints on authentic teaching, whereby technology mediates social interactions, typically asynchronously, with students primarily interacting with technology (Fryer & Bovee, 2018), which can reduce the human interpersonal relationship. However, technology and online environments, if appropriately utilised, can help facilitate authentic teaching. For example, Motschnig-Pitrik (2005), combining elements of online learning and person-centred teaching, an approach called person-centred e-learning (PCeL), suggests that online environments and technology can help facilitate the building of interpersonal relationships and authentic teaching. Firstly, online learning technology can free up personal resources, as it can be the mechanism by which content is easily transferred to the student, affording more time for open authentic discussion between teacher and students, such as open discussion around expectations and course content, allowing for authentic presentation of self. Multiple modes of communication can also be utilised from synchronous online face-to-face communication with its full range of expression (e.g. tone, body language) to live digital media platforms (e.g. live chat, forum). Multiple modes of communication can be beneficial as some students may feel more comfortable engaging in a certain

modality (e.g. anonymous forums). Facilitating authentic discussion and sharing reactions to aspects of the course and reflecting on those reactions in an open online platform can be beneficial for both student and teacher as it allows for expression and awareness of inner feelings (Motschnig-Pitrik, 2005). Whatever the mechanism, the online teacher can be aware of their own experience, their feelings, and behave and communicate in an authentic way, contributing to meaningful learning.

Improvements in online technologies, curriculum, teaching skills, and policy have brought many benefits to higher education, but it is suggested here that authentic communication is an important basic human characteristic that can get lost amongst change and innovation. There is an interpersonal side to good education that deserves attention and in online environments, if used appropriately, there are many opportunities to be authentic. When teachers show that they are a real person, they build important relationships, and they can improve education in a basic way. Authenticity is therefore particularly important in the emerging online education medium, as a powerful way of making a potentially impersonal education authentically personal.

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Chapter 15
Accessibility and Inclusivity in Online Teaching

Astrid Coxon, Fabio Arico, and Jeremy Schildt

Abstract The radical uptake of technology-enhanced learning practices and online education in recent years has made tertiary education more feasible for a more socially and culturally diverse student body. Despite these developments, there is limited published research which explores how this new frontier of tertiary education teaching is experienced by students. In particular, our understanding of how online education impacts students with specific learning difficulties (SpLDs, such as autistic spectrum disorders, dyslexia, dyspraxia) is limited. There are notable differences in the needs and preferences of online students with and without SpLDs, and this must be reflected in teaching provision. Despite a growing awareness for issues of accessibility, provisions are often designed without robust consultation with those learners most directly affected by changing practice, i.e. students with SpLDs. A better understanding of how students with SpLDs use and experience online education is a prerequisite to developing truly inclusive teaching and learning practices, which provide all students with equal opportunities in tertiary education. This chapter will explore the current literature surrounding accessibility for students with SpLDs in tertiary education online learning. More specifically, it will outline some of the key barriers faced by SpLD students accessing online learning and discuss ways in which these could be managed proactively (beyond a box-ticking exercise in "reasonable adjustment"). Finally, it will highlight some key considerations and recommendations for designing online teaching experiences which emphasise accessibility and inclusion for all students in tertiary education.

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15.1 Introduction

The use of online teaching in tertiary education has seen a dramatic rise over the past decade, with elements of online resources now a common feature across a broad range of courses and institutions. As well as complementing existing face-to-face teaching, colleges and universities are increasingly offering courses delivered wholly via online teaching methods. By offering online teaching methods, tertiary education institutions provide learning opportunities to an increasingly diverse student body.

Online teaching has the potential to overcome a broad spectrum of geographic, social and structural barriers, enabling students who might otherwise be unable to engage with on-campus education. This is a particularly promising prospect for students with specific learning difficulties (SpLDs) such as dyslexia and dyspraxia. Gregg (2007) describes these students as often "underserved and unprepared" for postsecondary education, enrolling in university courses at a significantly lower rate compared to the general population. According to Richardson and Wydell (2003), students with SpLDs have generally poorer rates of retention and achieve lower average grades than those students with no declared disability. The radical development and uptake of online teaching methods offer opportunities to integrate flexible teaching and learning practices to support the diverse needs of a diverse student body, potentially improving students' experiences of and attainment in tertiary education.

However, despite the growth in online teaching, there is a lack of robust research exploring SpLDs students' experiences—how do new teaching practices impact these students? How do they use developing practices within their studies? Are their specific needs met in a positive way that promotes attainment? Without these insights, it is challenging to develop truly inclusive teaching practices which provide all students, regardless of disability status, an equal opportunity to engage with tertiary education.

15.2 Definition

According to the British Dyslexia Association (2018), SpLDs (also sometimes referred to as "neurodiversity and co-occurring differences") encompass a range of neurological differences which can impact learning and information processing. These difficulties are uniquely experienced by each individual, but common characteristics include memory difficulties, organisational difficulties, reading and writing difficulties, difficulties with executive function, visual and auditory processing, and issues with sensory distraction and sensory overload. Common SpLDs include dyslexia, dyspraxia, dyscalculia, Attention Deficit Hyperactivity Disorder (ADHD) and Autistic Spectrum Disorders (ASD).

In UK tertiary education, institutions are required to make "reasonable adjustments" to ensure that disabled students (including those with SpLDs) are not unfairly

disadvantaged (HMSO 2001).[1] The term "reasonable adjustment" refers to a number of practices, including ensuring staff have relevant and appropriate training to support students' needs, ensuring students are able to access resources and facilities in a format appropriate to their needs, or allowing extra time to complete coursework or exams.

Although the uptake for formal support and adjustment is generally high, these provisions have predominantly been designed in response to identified needs in face-to-face teaching. Roberts et al. (2011) criticise emerging online teaching for unknowingly disadvantaging students with disabilities; these courses are often designed without considering potential accessibility issues, and as such often undergo a costly design–redesign process to meet students' needs post hoc. Not only is this costly for institutions, both in terms of time and resources, but it also relies on students actively disclosing specific accessibility issues as they arise. These issues may not be immediately soluble (for example, if learning materials need to be re-created in an alternative format) and can have lasting consequences for students' learning experience. In their 2017 article, MacCullagh and colleagues highlight a number of formal adjustments and student services offered to SpLD students, as well as student-generated compensatory and coping strategies, utilised by dyslexic students to support their learning in tertiary education. The latter suggests that without proactive consideration of diverse student access needs, the mental labour of navigating learning materials is potentially, unwittingly deferred onto the students themselves.

15.3 Delivering Lectures

The most immediately obvious difference between face-to-face and online teaching is the way in which formal lectures are delivered. Online lectures are, by and large, pre-recorded by teaching staff and released at pre-determined points for students to watch in their own time. According to research by MacCullagh et al. (2017), both students with and without dyslexia appreciate the convenience of these pre-recorded lectures (and other asynchronous teaching materials) as they allow students to easily watch and re-watch at their leisure, pausing and re-winding where needed for clarification or to take notes.

However, the format and quality of pre-recorded lecture materials, much like traditional lectures, vary considerably, impacting students' experiences and their ability to engage with materials effectively. Regardless of the specific mode of lecture presentation, the quality of pre-recorded lectures is of high importance for student engagement. Poorly produced video lectures with external noise (both visual and auditory) can be distracting for students, particularly those with auditory and visual

[1] Similar requirements are apparent internationally, such as the USA federal legislation to make reasonable modifications under the Americans with Disabilities Act, 1990.

processing difficulties. At the very least, lectures should be recorded in a quiet environment. However, a well-lit recording studio with good quality equipment produces a more professional and engaging lecture for students to follow.

Regarding the format of video lectures, some pre-recorded lectures feature lecturers speaking to camera, but more commonly have teaching staff providing voice-over for a series of slides. For some SpLD students, the lack of facial or gestural cues from teaching staff in these voice-over style lectures may present a considerable barrier to learning engagement. Similarly, where slides are dense with text, this may pose specific challenges for students with visual and auditory processing issues, particularly if the voice-over provides different information which could contribute auditory distraction to the written information provided. A possible compromise would be to provide video recordings of lecturers speaking to camera (to aid students who benefit from facial and gestural cues), with the option for closed captions (for students with auditory processing issues) or to listen to an audio-only version of this material (for students who have issues with visual distraction). A further possibility is to provide a full written transcript of the lecture (to support students who prefer to review text-based information) and any additional notes or supplementary materials as separate downloadable files (so as not to create additional distraction within the lecture itself). As Kent (2015) highlights, one of the key advantages of online learning is that learning materials can be presented in multiple forms, and by providing different options to students we provide flexibility and choice. This flexibility is inclusive of all students, regardless of disability status, and allows students to manage their method of learning engagement more autonomously.

15.4 Provision of Learning Materials

Another key advantage of the growing prevalence of online teaching is that it provides increased opportunities to easily share a broad range of additional learning materials. Sharing reading lists, lecture slides and supplementary materials via virtual learning environments has been commonplace for courses delivered on university and college campuses, and providing these materials ahead of time (i.e. before lectures) is a typical reasonable adjustment made for SpLD students (see Siemens et al. 2015). In wholly online courses, the ability to share digital resources directly to students is utilised further, but what and how these are shared needs careful consideration.

As highlighted by Badge et al. (2008), it is important to again offer resources in a variety of formats, so that students are able to choose the format most appropriate for their specific needs. For example, if students have visual or reading difficulties, they may need to access handouts in Word document format rather than directly from within learning management systems, so they can edit font style and colour, or use text-to-speech technology.

In a qualitative study we conducted in 2018 (Coxon et al. 2018), SpLD students reported that learning materials were often provided to them as PDFs, which were not easily re-formatted or immediately compatible with text-to-speech software.

Although workarounds exist to convert PDFs to Word documents, these are not always free or faultless, and again places an additional burden of labour on the SpLD student to either request alternative formats from teaching staff (and wait for these to be provided) or to try converting these files themselves (with varying degrees of success, depending on their technological proficiency).

As well as formal supplementary materials, MacCullagh et al. (2017) found that more than 35% of the dyslexic students in their study employed "compensatory strategies" to overcome challenges in engaging with tertiary education. Many SpLD students choose to find their own videos online to supplement prescribed reading, finding it easier to understand key concepts in this format. It is important for educators to recognise the breadth of student ability and preference when providing supplementary learning resources in order to produce or recommend specific resources that both meet learning outcomes and suit individual student needs. As highlighted by Burgstahler (2015), by designing course content with an attitude to accessibility, this makes courses usable and inclusive of all students, regardless of disability status. Accessible materials, such as videos with closed captions or handouts compatible with screen reading software, may benefit students who have not formally declared SpLD status. Students may have chosen not to disclose SpLD status for a variety of personal reasons or may have accessibility issues but are not aware that they may be able to (or do not wish to) pursue a formal assessment. By emphasising accessibility, rather than focussing on addressing specific SpLDs on a case-by-case basis, educators are in a position to create learning environments which are inclusive of all students (see Cinquin et al. 2019). Consulting with SpLD students directly, either in a purposeful focus group activity or as specific course review focus, can provide useful insights into student experience.

15.5 Reflections and Recommendations

The use of online teaching methods presents the opportunity for widening participation amongst an increasingly diverse student body. For students with SpLDs, online teaching allows learning materials to be delivered in a broad range of formats. This enables students to make choices in how they engage with their learning in a way that suits their individual needs. However, this can only be possible if online learning environments are designed with a proactive attitude towards accessibility. First and foremost, teaching staff should at the very least be supported to develop a good awareness of and sensitivity to a broad range of student needs, including types of discrete accessibility issues, rather than encyclopaedic knowledge of the classifications of SpLDs. They should also be aware of the barriers that might be created for students in the way courses are designed and delivered. For students who formally disclose SpLD status, reasonable adjustments must be made by institutions to ensure these students have equal opportunity to engage meaningfully with their education.

Although uptake and provision of these adjustments are generally good, this approach relies on students not only having a formal diagnosis, but also expecting

them to disclose this in order to access support. Instead, we recommend that accessible options are available for all students, by offering learning materials in different formats, some of which may be adapted by the students themselves where needed or desired. For example, simply providing a written transcript of lecture recordings in an editable form allows students to read through these at their leisure, change font style, size or colour, or use text-to-speech software. Providing closed captions (and the option to enable or disable these) again provides choice to students in how they access and engage with core learning materials.

There is no definitive list of what should be included in accessible online course design, and options will inevitably grow and develop alongside emerging technologies. Instead, guidance should be sought from SpLD experts and specialists: psychologists, researchers, teaching staff, but most importantly, SpLD students themselves. By exploring the experiences of these students, in their own words, it is possible to better appraise current practices and identify areas for change and development. What do students currently find beneficial? What specific barriers do they face in their learning? What else do they need? How could things be improved further? As SpLDs are experienced uniquely, specific needs and preferences will vary, and addressing these needs on an ad hoc "reasonable adjustment" basis runs the risk of overlooking some students with discrete accessibility needs. The emphasis should always be on increasing access to options and choice, as this has potential to benefit all students. By putting accessibility at the centre of course design, educators create options for students in how they choose to engage with their learning; this in turn creates a learning environment which is truly inclusive of all students.

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Chapter 16
Creatively Flexible, Technology Fluent—Developing an Optimal Online Teaching and Design Mindset

Danah Henriksen and William Cain

Abstract In this chapter, we propose that online courses or programs require what we term as a *creatively focused and technology fluent* mindset (a "CFTF" mindset) on the part of faculty, instructors, instructional designers and other program stakeholders. Such a mindset must be grounded in multiple things: a knowledge of the discipline and of teaching with technology, a creative willingness to try new things and experiment with technologies, and a willingness to push students to consider and re-consider what they know. Through this chapter, we describe the context for change in emerging opportunities for online learning environments and then describe the factors that comprise a CFTF mindset for instructors, designers and developers in online environments. This mindset is built upon theoretical foundations in creative thinking, openness and willingness to experiment. Finally, we share examples of how CFTF has played out in one course in the Educational Leadership & Innovation Ed.D. program at Arizona State University, along with reflections and recommendations—as a means to exemplify what such a mindset might look like in real-world online learning settings.

16.1 Introduction

In recent decades, digital technologies have revolutionized how we live, work and think. This fast pace of change has been a challenge in teaching (Zhao, 2012), particularly in higher education, which has experienced a trend towards online forms of learning. The need for innovation in higher education will only increase (Dill & van Vught, 2010); and as our world transforms through new technologies there are opportunities to consider varied structures and approaches to learning (Henriksen, Mishra, Greenhow, Cain, & Roseth, 2014). Such opportunities require that we carefully

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consider the core purpose and goals of any learning experience, and then creatively re-consider the design, affordances and constraints of online spaces that connect with this core purpose.

In this chapter, we argue that online courses or programs require a *creatively focused and technology fluent* mindset (a "CFTF" mindset) on the part of faculty, instructors, instructional designers and other program stakeholders. Such a mindset must be grounded in multiple things: a knowledge of the discipline and of teaching with technology (Mishra & Koehler, 2006), and a creative willingness to try new things, experiment with technologies, and push students to consider and re-consider what they know. We describe the context for change in emerging opportunities for online learning environments. We then propose this mindset for instructors, designers and developers in online environments, discussing its theoretical foundations in creative thinking, openness and willingness to experiment. Finally, we share examples of how CFTF has played out in one course in the Educational Leadership & Innovation Ed.D. program at Arizona State University, along with reflections and recommendations.

16.2 Emerging Contexts Pushing us Forward

In recent decades, online education has not only emerged on the scene of higher education, it has flourished and become mainstream practice. However, in the historical context of teaching and learning, online learning is still comparatively new. Many instructors—even those with extensive teaching backgrounds—may not have been trained in designing or teaching for online learning. In many cases, this has resulted in a tendency to teach the same way they might a traditional course, or simply assume that there can be a one-to-one mapping of traditional face-to-face content into the online space (Crews, Wilkinson, & Neill, 2015). Yet, working, thinking and learning in online spaces can be fundamentally different from traditional in-person spaces, even while many of the core principles of learning remain valid. This may necessitate a willingness to find novel and effective (i.e. creative) approaches to rethinking a course design, or taking a subject matter and considering how best to teach it online.

Academia has traditionally been steeped in practices that were built around face-to-face experiences. This is particularly true in graduate learning settings, which have often used apprenticeship-like models, where advisors pass on the values, norms and rules of the academy in focused, one-on-one interactions or research and teaching experiences. However, the growth of online learning has sometimes disrupted these traditional models. In its nascent stages, online learning was frequently dismissed as lacking the affordances to support the types of in-depth, rigorous interactions that fit with established models of higher education. However, as technologies and methods have improved, universities have responded to the increasing demand for online learning across a wide variety of subjects, programs and levels of learning.

Critics of online learning may still question whether these modalities evoke the types of experiences that equal or exceed face-to-face learning; or they might ask

if enough is known about the online medium to develop practices that respect the complexity of higher learning. Such questions are worth considering—not because online modalities are inherently lacking—but simply because such questions should arise in any instantiation of learning. Whenever or however we develop or deliver courses, we must critically consider how the content, medium or technologies and contextual details coalesce to provide learning experiences that are effective and connected with pedagogical goals.

Towards this end, this chapter proposes instructors and designers of learning in online settings adopt what we term a creatively flexible and technology fluent mindset. Both creativity and technology fluency are emphasized in discussions of twenty-first-century skills (Mishra, Henriksen, Boltz, & Richardson, 2016). We suggest that such a mindset is valuable in any instantiation of twenty-first-century learning, given the prevalence of new technologies and need for instructional creativity. However, we see it as particularly relevant for adapting ideas and content into online realms. The affordances, constraints, opportunities and challenges of online learning can be different from traditional settings, and online technologies evolve continuously, requiring flexibility, creativity and ease with trying new tools. In the following sections, we lay out the theoretical basis of the CFTF mindset, followed by brief examples to instantiate it.

16.3 The Foundations of Creativity and Technology Fluency in Mindset

The value of creativity in teaching is inarguably fundamental to developing learning experiences that are engaging and effective (Henriksen & Mishra, 2015). Creativity in and of itself, however, is a vast construct and an extensive area of research, even within the bounds of education. Accordingly, we must lay out how we define creativity when we describe a mindset for creativity. As follows, we examine relevant creativity literature and then pair this with the idea of technology fluency, ultimately considering how these intersect in a CFTF mindset.

16.4 Creativity as a Component of Mindset

Creativity can (and should) play a central role in teaching and learning—but defining and applying its core principles can be challenging (Sawyer, 2015). While creativity is often thought of in subjective terms, most research defines it as having two complementary components: novelty and effectiveness. A creative idea, process or product is *novel* when it brings forth something that either did not exist before, even if in a comparatively small or local setting. At the same time, a novel idea with no potential

use cannot be considered "creative" because novelty does not guarantee that something will be *effective* (Cropley, 2003). Thus, creative ideas or artifacts must also be effective or useful, logical, understandable and valuable within context.

The problem of creating novel and effective learning experiences in online studies is that the contexts are still relatively new or evolving, such that we do not always fully understand how the goals, outcomes or challenges will emerge. In evolving technological contexts, change and uncertainty are almost constant. This is why we suggest teachers and instructional designers focus on a *mindset* that corresponds with the broad strokes of creative thinking, rather than chasing specific outcome targets of novelty and effectiveness. Henriksen and Mishra (2015) provide evidence that effective, creative teaching is reflected in the mindset that teachers hold. By understanding and aiming for creative and flexible teaching mindsets, we are better positioned to figure out new and better ways to teach students in online contexts.

Existing creativity research has provided insights on traits or personality characteristics that are associated with a creative mindset (Runco, 2014). For example, *flexibility* and *fluency* are characteristics that describe how creative people can flexibly adapt to change, and come up with ideas and solutions (Karakelle, 2009). Likewise, the related trait of *openness* is needed to support adaptability and the ability to see new possibilities. Psychology research has identified individual traits correlated with creativity, including flexibility, open-mindedness, tolerance for ambiguity, intellectual risk-taking and willingness to "play" with ideas or details, or tinker with plans and designs (Prabhu, Sutton, & Sauser, 2008). Finally, researchers maintain that adopting or practicing habits of mind like flexibility and openness can influence creative skill growth and performance (Karwowski, 2014).

Aspects of a creative mindset, therefore, include *flexibility, open-mindedness, willingness to try new things* and *intellectual play* or *risk-taking*. These overlap with and relate to the ability to be adaptive and identify or try new ideas and plans. Amabile (1983) notes that there is no guarantee that people with these traits are "creative", nor do the traits provide a "formula" for creativity. Rather, enacted as habits of mind, these traits prove helpful in situations or goals requiring creative thinking.

These habits of mind naturally fit with the challenges of twenty-first-century teaching and learning. Despite the challenges of standardization across education, and pressures or evolving demands in higher education, there is increasing recognition that creative thinking is essential to addressing learning and instructional challenges (Zhao, 2012). In addition, Henriksen and Mishra (2015) showed that successful teachers integrate creativity as a mindset into their practice. The award-winning teachers they studied described creativity as an integrated openness in their thinking, a willingness to try new things and a belief that creative thinking is accessible to everyone. This is especially relevant in today's new and emerging educational contexts, in which the world is changing, standards are being redefined, and practices develop along the way. As Cropley (2003) asserted:

> (Education) cannot limit itself to the transmission of set contents, techniques and values, since these will soon be useless to living a full life, but must also promote flexibility, openness for the new, the ability to adapt or see new ways of doing things, and courage in the face of the unexpected, in other words, creativity. (p. 136)

The defining characteristics of creativity in a broader CFTF mindset are intellectual risk-taking, flexibility, open-mindedness and a willingness to try new things. This topic of pedagogical mindset and creativity has value when we think about the kinds of knowledge or approaches that online instructors need to successfully engage their content, design effective coursework and teach in technology-rich contexts.

16.5 Technology Fluency as a Component of Mindset

Much of our discussion of mindset has focused around creativity, but there is another aspect of CFTF we emphasize: technology fluency. We use the notion of *technology fluency* not to describe technology expertise or in-depth knowledge of technology, but as an orientation to approaching technology in ways that serve the content and context for student learning. This relates to the theory of Technological Pedagogical Content Knowledge (TPACK). TPACK is a framework that addresses teachers' awareness and knowledge of technology integration for teaching. Mishra and Koehler (2006) developed this theory based on Shulman's (1986) foundational work defining Pedagogical Content Knowledge as the relationship between knowledge of subject matter and pedagogical knowledge about teaching. The TPACK framework weaves technology into the mix of pedagogy and content, challenging the conventional separation of these domains in educational practice.

Our notion of a CFTF mindset recognizes that instructors in technology-rich twenty-first-century contexts should have a fluidity of approach as they weave between content, pedagogy and technology. Again, we note that technology fluency need not refer to significant technical expertise and experience with technology. This would be an unreasonable goal for most instructors, whose expertise lies around pedagogy and content. Rather, it means that as instructors and course developers work in new settings where digital opportunities and constraints are foregrounded, they must observe the fluid intersection of pedagogy and content, and how technology can mediate this.

As denoted by the creativity components of flexibility and openness, instructors should be aware of and consider how to address viable approaches to the content through different technological means. In online contexts, instructors must be willing to experiment and try new approaches to communicating and teaching in digital spaces. Importantly, we do not suggest all instructors use this mindset to fit the same mold. Rather, instructors can retain their own unique styles and ways of thinking about the content but adopt this mindset as a lens for their teaching content and context. Then, when their own teaching orientation is paired with these mindset traits, they can teach online in ways that suit them.

We recognize the complexity of ways of translating existing ideas, goals and norms of education into the comparatively newer contexts of online education. There are a range of possibilities, based on how content, pedagogy and technology intersect for each situation. To help us consider how CFTF might be enacted in practice, we share examples from the online redesign of an already successful face-to-face program: the

Arizona State University Ed.D program in Leadership and Innovation. While sharing examples from one program is limited in scope, our aim is simply to provide a sense of what applying a CFTF mindset might look like in facilitating online design.

16.6 Redesigning an ASU Doctoral Course to Move Online

For many years, the ASU doctoral program in Educational Leadership and Innovation served as a successful face-to-face program, recognized by the Carnegie Foundation in the Education Doctorate. In 2015, it began serving its first cohort of online doctoral students. This move into an online space (while seeking to uphold the program's reputation for quality and rigour) required a rethinking of existing coursework. One of these course redesign and teaching efforts was undertaken by this chapter's first author. Our goal here is to showcase elements of course redesign to highlight the importance of a CFTF mindset.

16.7 Example 1: Harnessing Openness for Systems Change and Leadership

The course to be redesigned was titled *Systems Change and Leadership*, and it focused on viewing education as a system in order to look at the embedded nature of educational challenges. In redeveloping the content and coursework, it was necessary to creatively work around the medium's constraints (e.g. less immediacy in student–student social presence and "togetherness") and also take advantage of the affordances (e.g. greater learner autonomy and diversity of student background and experience). For some instances of redesign, this meant using a CFTF mindset to find new, technology fluent approaches to key assignments that fit the more independent and flexible context. In other cases, it meant coming up with brand new assignments that covered content but also leveraged the technological medium. Here, when assessing which course elements to redesign and which to create from scratch, it helps to remember that creativity is not always about dramatic change.

For example, in one assignment from the face-to-face content, students conducted weekly in-class observations of educational sites (the whole class visited local sites and students' individual observations). Students submitted their individual site observations to the instructor at the end of the course. Students had enjoyed this activity, as it offered opportunities to practice informal research. But in moving online, students could not all observe the same sites at similar times. However, there were opportunities for more diversity of site observations and sharing across contexts. Evaluated through a CFTF perspective, the assignment was adjusted so students could choose (over five weeks) five different sites for individual review, which they then shared and discussed online. The kinds of sites broadened to include any type of physical

or virtual space where people were communicating ideas or learning. Rather than simply turning in a journal at the end, each student was now required to create their own online blog, which they would journal in weekly with images, observations and reflections around systems thinking and course content. The diversity of observation subjects was also expanded, to not only include school sites, but also sports practices, ballet classes, museums, libraries, college campuses or virtual sites. Leveraging the medium of their blog sites, students could now include links and images to enrich their work. More importantly, using blog sites for journaling meant students could share and read peers' work, making their thinking visible for the online learning community.

There was initially some resistance from the program's instructional design team about assigning students to create their own blogs, based on the concern that the Ed.D. students may not be technology fluent. But taking into account the need for openness and flexibility, they were convinced the new online design could make the assignment more learner-driven and more accessible. As Shulman (1999) noted, "Learning is least useful when it is private and hidden; it is most powerful when it becomes public and communal" (p. 11). Indeed, some students confessed that they initially viewed the blog site as just "one more task to have to do, when it could just be a written assignment for the instructor". But given time, students overwhelmingly commented that they felt empowered by publicly sharing their work. This reaction provides encouraging evidence that rethinking how a key assignment could shift for online instantiation can lead to small but meaningful changes pushed forwards by a creative, technology fluent mindset.

16.8 Example 2: Technology Fluency and the Multi-Modal Innovation

The creation of a multi-modal text assignment is another example of how CFTF supported successful innovation in the redesign of *Systems Change and Leadership.* A key part of the face-to-face course version had been the reading of a common text, after which small groups presented in class covering different chapters. In thinking about the core pedagogical goals—deep reading of a text and collaboration to communicate key takeaways—an online space presented a chance to do something different using media.

Applying a CFTF mindset, a new assignment emerged in lieu of the standard presentations: the Multi-Modal Chapter Text assignment. Small groups were still assigned chapter readings. They then worked collaboratively to build a multi-modal text, sharing key ideas and takeaways from the book, and then applying them to practical applications and implications. In doing this assignment as multi-modal (via Google docs or other relevant technology applications), they were able to reflect ideas through collaborative text that required embedding links to enrich the content-making connections to and sharing other relevant resources, videos, images or other

media. Students were still required to do the reading and present ideas, but enacting the assignment in a collaborative online medium empowered them to look further to find interesting related resources that could be embedded in a rich, visual and shareable text. The result was a flexible, open and technologically fluent approach to a core learning activity that met initial learning goals and then built on them. The new assignment configuration also offered students a chance to practice everyday creativity on their own to enrich the content and make it interesting and compelling for others.

16.9 Reflections and Recommendations

Although many other assignments in the redesign of *Systems Change and Leadership* and other courses in ASU's doctoral program in Educational Leadership and Innovation provided CFTF-based opportunities for bigger changes or significant overhaul, it is not possible to cover all of this within the scope of this chapter. However, our goal here has been to offer a multi-point illustrative example of what a CFTF mindset, combining creativity and technology fluency, might look like in practice. As we reflect back on these experiences, we wish to share our CFTF recommendations for current and future educators.

It is critical to note that "creativity", in terms of mindset shifts, does not necessarily denote large-scale or sweeping innovation. *Small CFTF innovations can grow significantly (if you let them).* As in the case of the redesigned site observation exercise, transferring assignments from their traditional settings to online environments can open whole new areas of engagement and learning. As Hofstadter (2008) notes, creative thinking is often about twisting existing knobs rather than implementing landmark changes. Sometimes entirely new innovations may arise when instructors engage an open mind towards new ideas, but equally important for creativity is to be mindful of small but powerful changes to traditional approaches to suit an online medium.

It is also reasonable to expect some resistance when broaching traditional practices with a CFTF mindset. Traditions are often comforting—they reflect time-honored practices and values and are often not easily discarded. This can be true both in external pressures (from departments, other faculty or institutional structures, etc.) or even those within ourselves. *By being observant of where any resistance to new ideas emerges from and then referring back to the core principles of our CFTF mindset (i.e. openness, flexibility, etc.,)* we can be better positioned to thoughtfully address and move past these concerns.

Finally, we suggest that a CFTF mindset is best when shared among key stakeholders (instructors, students, instructional designers) and that often mindset can be influenced from positions of leadership. Thus, *it becomes important to lead from wherever one sits* (be it as a teaching assistant, lead instructor, course designer or departmental leadership) by sharing and modelling inventiveness, openness to new ideas and structures. CFTF-minded discussions may be useful as a preface to course

design or redesign efforts in order to get as many stakeholders on board earlier rather than later.

In conclusion, we have suggested that instructors, course designers and other stakeholders in online contexts should adopt a CFTF mindset for creativity and technology fluency. The broadness of this mindset means that there are limitless ways to apply it, and there is much diversity of application, based on instructor style, pedagogical goals and other situational factors. Our examples are not groundbreaking but as exercises in CFTF, they suggest how teachers and instructional design teams can make small or large changes to engage with the new in online settings. Through this, we hope that more stakeholders will be ready to creatively engage with new learning contexts, as digital learning becomes more all-encompassing.

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Chapter 17
Ready or not, Here I Come—Preparing Online Students for the Real Working World

Ashleigh Schweinsberg and Filia Garivaldis

Abstract Teaching and learning in higher education are being evaluated more and more based on the extent to which they contribute to students' work readiness. Work readiness skills include non-technical, non-clinical, generic and transferrable skills, such as teamwork, communication and problem-solving—some of the most necessary skills desired by employers (Acnielsen Research Services, Employer satisfaction with graduate skills: Research report, Department of Education, Training and Youth Affairs, ACT, 2000; Commonwealth of Australia, Employability skills for the future, Department of Education, Science and Training, Canberra, ACT, 2002). Broader aspects of work readiness that have been measured in university students include organisational acumen, social intelligence, personal characteristics and work competence (Caballero, Walker, & Fuller-Tyszkiewicz, 2010). Professional skills such as creativity and critical thinking are all the more important in a digital era (Grand-Clement, Digital learning: Education and skills in the ditigal age, Corsham Institute, RAND Europe, St George's House, Cambridge, UK, 2017). As such, there is a general shift in interest in higher education to educational practices that cultivate collaboration, teamwork and other interpersonal and soft skills, which often rely on face-to-face interaction (Hill et al., Chemist Education, Research and Practice 20:68–84, 2019). This chapter will operationalise work readiness and discuss how it is addressed in higher education, both within online and on-campus modes. Recommendations will be provided as to how to embed work readiness skills into online education curriculum, specifically to assist students to develop work readiness and to empower educators to position graduates to enter the workforce with their best foot forward.

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17.1 Introduction

There is a rapidly increasing demand for online learning, with approximately 1 in 5 students now engaged in some form of off-campus education attendance (Grattan Institute 2018).

Online education may prepare students for work for reasons including the evolving emphasis on advanced technology within the workplace, the growing prevalence of working remotely and evidence-based improvements to the pedagogic practices of online education.

In a modern world, it has been evidenced that employers are seeking graduates who not only have industry-specific academic knowledge but who are able to keep up with a rapidly evolving environment (for instance, as technology changes; Hager and Holland 2006). Additionally, individuals are sought who are able to reflect, synthesise and analyse large quantities of information related to their specific trade (Harvey 2003). Skills such as these may not always be learned in the classroom or during academic teaching periods; these skills may come from non-curriculum-based activities or cultural immersion in university life.

More specifically, employers are increasingly expecting graduates to be "work-ready" when they enter the workforce. Work readiness is defined as the perception that graduates possess the skills and attributes that are indicative of job performance and career advancement (Caballero and Walker 2010; Caballero et al. 2011). Work readiness has become a central part of the selection criteria for graduate work, in many cases superseding the importance of academic performance (Hamilton et al. 2017; Walker and Campbell 2013). This is because work readiness has been linked to career advancement potential, role performance and job success (Casner-Lotto and Barrington 2006).

However, research indicates that graduates do not currently meet the demands of industry (Boden and Nedeva 2010; Hart 2008; Jackson and Chapman, 2012). In particular, skills around personal and relational competence are the least developed in graduates and are not directly taught in a tertiary setting (ACNielsen Research Services 2000). The implications of a theory-to-practice gap for industry are broad and include obtaining new employees who are not work-ready, but who are also not work safe. This requires time and fiscal resources to be expended to adequately train them before they can be deployed competently in their hired role.

Beyond industry, the implications and risks of the theory-to-practice gap have a significant impact on universities' branding and perception, on student outcomes and by the way of reduced desirability of prospective students (Boden and Nedeva 2010). The gap cannot be addressed simply by sending students prematurely into industry, as previously done (via increasing student placements). Rather, higher education institutions must address this gap by incorporating non-technical skills training into the curriculum, bringing industry to students (Cassidy 2006). However, the feasibility of stretching an already overburden curriculum is noted.

17.2 Operationalisation of Work Readiness

The concept of work readiness grew in popularity post-2000 when the literature turned from a focus on employability. It is posited that this shift occurred due to a growing demand to employ individuals who were able to enter the workforce with little retraining to ease the burden on industry when employing new graduates (Boden and Nedeva 2010). Employability has been defined as "*the propensity of the graduate to exhibit attributes that employers anticipate will be necessary for the future effective functioning of their organization*" (Harvey 1999, p. 4). Alternatively, work readiness can be defined as per Caballero and Walker (2010) as the level of preparedness for successful transition from student to employee. Work readiness is more of a concern for universities as students transition from student to pre-professional and will therefore be the focus of this chapter. For the purposes of this chapter, work readiness can be conceptualised as discipline-specific and represents a personally orientated set of skills and traits possessed by a graduate.

A model of course provision described by Bennett et al. (1999) depicted in Fig. 17.1 has been adapted to describe work readiness as defined above. It denotes that generic skills sit at the heart of a student's construct for work, intermingled with university-learned discipline-specific content and skills. In addition to this, generic and discipline-specific skills are in turn informed and developed through a transactional process by the awareness, experience and feedback provided by the workplace. This process depicts the role of both generic and industry-specific skills which underpin work readiness.

More broadly from an academic perspective, the above model suggests that courses that offer a mix of theory, research and practice are going to be well placed to develop work-ready graduates who embody the graduate attributes set forth by their respective educational institutions, as well as the industry-specific graduate outcomes that improve a graduate's employability chances. Table 17.1 provides a comparison of skills and attributes of five prominent employability and work readiness frameworks, to demonstrate similarities and more prominently differences between

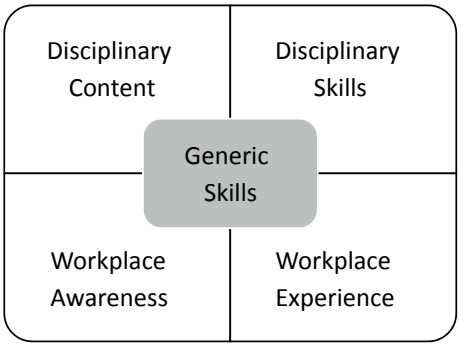

Fig. 17.1 Course provision by Bennett et al. (1999, p. 80) adapted for work readiness

Table 17.1 Work Readiness Skill Comparison between five frameworks

Skill	Work Readiness[a]	UTS Work-Ready Skills[b]	GCA[c]	Employability for the future[d]	NACE[e]
Communication Skills	■	■	■	■	■
Teamwork / Leadership	■	■	■	■	■
Drive & Commitment / industry knowledge	■	■	■	■	
Lifelong learning / self-management / academic results	■	■	■	■	
Critical Thinking / Technical Skills	■	■	■		■
Global Perspective / Cultural Awareness	■	■	■		■
Professionalism	■	■			■
Technological Literacy		■		■	■
Planning & organisation	■	■		■	
Problem-Solving	■			■	
Personal Development	■		■		
Resilience	■		■		
Work Experience			■		
Enthusiasm		■			
Information Literacy & Management		■			
Research		■			
Adaptability / Flexibility	■				
Motivation	■				
Social Responsibility / Personal Skills	■				

Note Skill sets have been broadly categorised to compare frameworks
[a]Work Readiness (Caballero et al. 2011)
[b]UTS Work-Ready Skills (Litchfield et al. 2010)
[c]Graduate Careers Australia (2014)
[d]Employability Framework (Australian Department of Education Science and Training Australian Chamber of Commerce and Industry & Business Council of Australia 2002)
[e]Career Readiness, NACE (National Association of Colleges and Employers 2019)

these frameworks. This table shows unequivocal agreement around the importance of communication skills and teamwork/leadership skills.

However, student factors need to be considered when applying any framework of work readiness. For instance, many students struggle to articulate, formulate or identify what transferable skills they have (Masole and Van Dyk 2016). In being ill-equipped to express what skills they have, graduates may be unable to assert to employers their work readiness and employability (Aznal et al. 2017). Further, if students or graduates cannot detail what skills they have, what they have learned and how they have learned it, it suggests that this process may not be internalised and, as such, not self-completed or continued to be cultivated post-graduation by students during their educational and professional formation (Kinash et al. 2017). Students may be in receiving mode, as opposed to taking control of the skill sets that they require for entering industry, thinking of immediate goals such as passing an assessment, rather than long-term goals of gaining employment in their chosen field. Extending this, a graduate's work readiness is impacted by factors such as career certainty, level of emotional intelligence and optimism, whereby the more certain and optimistic students are of their chosen profession the more likely they are to cultivate specific skills to that industry, thus improving their work readiness (Aznal et al. 2017; Foster 2006).

17.3 Online Learning and Work Readiness

Post-industrialised and modernised universities are changing—being increasingly viewed as places where students receive not only education but personal development which is foundational to work readiness development as explored above (Lees 2002). In other words, matriculating from university equipped with industry knowledge is no longer the end point of education. Instead, and as highlighted above, the modern graduate requires a plethora of skills to enable them to enter the workforce and obtain the positions they are seeking.

Furthermore, work readiness is just as relevant to online student cohorts, as it is to on-campus student cohorts, particularly as there is a growing trend towards online modes of study (Aithal and Aithal 2016). Online courses deliver learning material that is largely equivalent to on-campus courses, and this has helped establish corresponding equivalence in reputation and student satisfaction of these courses (Garivaldis, McKenzie, & Mundy, in press; Hurst 2015; Simonson et al. 1999). Equivalence in skill development should also be the focus. The interface used in online learning or computer-mediated learning (i.e. learning via a web interface) equips students not only with the traditional graduate attributes of their chosen tertiary education centre, but also new skills required for a modernised world, such as computer literacy.

Furthermore, the demographics of online students may enable a smooth transfer of work readiness curriculum directly to the workplace. This is because online students tend to be older in age and tend to work part-time or full-time alongside online

study, compared to students who study in the face-to-face mode. This suggests that online students are already an integral part of the workforce and that the workplace is brought back into these students' learning environments as professional experience (Colorado and Eberle 2010; Huh et al. 2010).

When considering both work readiness and the relative newness of online courses, it becomes apparent that how online courses develop work readiness is in need of exploration. Indeed, across the five prominent employability and work readiness frameworks depicted in Table 17.1, only motivation in the form of self-regulation and self-management (Roddy et al. 2017) and planning and organisation (McCarty et al. 2013) have been studied in relation to the online environment. As such, there is a prominent gap that needs addressing.

Despite a lack of well-established supporting evidence, it could be argued that certain skills are implicitly learned in online education which have been studied in traditional formats, as this form of education inherently requires individuals to.

1. Improve their communication skills, particularly the clarity of their verbal and written communication skills, due to the computer-mediated nature of the online environment, which necessitates this clarity (Senior and Cubbidge 2010).
2. Exercise critical thinking and technical skills, which are part of the inherent supporting skill set considered to be a pre-requisite for effective online study (Roddy et al. 2017), for instance, overcoming concerns relating to technical problems.
3. Possess drive and commitment, as well as flexibility and adaptability, as online students most often complete their studies alongside competing demands of family and work commitments (Roddy et al. 2017). Drawing on their maturity, professionalism and career certainty, which are of the common personal attributes amongst older online students, and skills indicative of work readiness as explained above (Aznal et al. 2017; Foster 2006).
4. Utilise effective planning and organisation skills with a need for students to be adequately prepared for the online environment given the multiple demands often exerted on students' time (Colorado and Eberle 2010). Additionally, preliminary research suggests that the grade differential between high and low achievers is exacerbated in online courses with high achievers excelling and low achievers returning lower grade point averages (McCarty et al. 2013). Coupling this with lifelong learning which also features as a common skill, online learning is uniquely suited to those who are more academically inclined to increase their knowledge base.
5. Be resilient and engage in self-care, which has been suggested to promote the ability to work within organisational norms, such as adapting to the demands of time-pressured work as has been studied in a nursing population (Hofmeyera et al. 2018).
6. Be motivated, as online learning inherently provides more autonomy and flexibility than alternate modes of teaching currently available (Chen and Hang 2010). Without an internal drive to achieve and complete required work, some students may not be able to complete a course delivered in an online format.

17.4 Reflections and Recommendations

Research into work readiness and its expression in the online environment is required to allow exploration of the individual attributes a student brings to a course which will directly affect their outcome in the course, including their perceived and inherent work readiness and employability. With research, the different needs of the many stakeholders involved when considering work readiness can be considered, and a holistic approach be taken such as has been completed in the realm of employability (Green et al. 2019).

A novel finding, which was alluded above and has been preliminarily explored by McCarty et al. (2013), is that online learning may be superior in some ways to traditional modes of learning when considering work readiness. By factoring in the individualised traits of the online student cohort which inherently attracts a more motivated, more engaged and more industry-focused (in terms of progressing through education) student. Their work readiness may be higher than that of their face-to-face counterparts, as they are on average, more inclined to perform and attain high academic standards to reach their pre-defined and often externally motivated (i.e. by industry body) factors. On the other hand, students not academically inclined, proficient in university-level study or career-focused; may be negatively impacted in online learning environments, as they do not have a clear goal in mind to their studies. It is important to note that this gap also appears in traditional education modes; however, preliminary research by McCarty et al. (2013) suggests that the online environment polarises this trend. Perhaps, instead of the false belief that online study is the *easy* option, a reconceptualisation of online study is needed to account for the unique pressures and barriers experienced by students studying in this mode.

In the meantime, and based on existing literature, the following recommendations are being made with the hope of increasing curriculum-derived opportunities in online education to develop work readiness:

1. Considering that online courses have established content equivalence to on-campus courses, the same work readiness initiatives that are delivered in traditional face-to-face courses can be translated to the online mode. For instance, work-integrated learning activities, involving the use of practical exercises and assessments, enables universities to bring industry into the classroom environment via virtual reality or other technological-enabled learning (Yongli Sun and Zheng 2010). Activities may include developing a curriculum vitae, interacting with colleagues and engaging in industry-specific tasks relevant to the educational stream of the individual student, such as exposure to industry language and environment to promote pre-professional development.
2. Through embedded individualised learning, online courses may be able to address student factors, such as career certainty and skill internalisation, to circumvent the perceived limitation of the reduced face-to-face interaction in this mode. For instance, soft skills, which come about via interaction with others and collaborative teamwork may be targeted indirectly, rather than through direct instruction. Coulson and Homewood (2016) have effectively used reflective practices,

which can be adopted within online as well as within on-campus curriculum, and which serve to align an individual's expectations and intent of their chosen course; impacting on the individual's ability to embody their professional identity post-graduation. Further, extracurricular activities are readily available via online media such as interactive learning platforms (linda.com), skill development reflection platforms (Monash Student Futures—see below for further information) and knowledge centres such as knowledge repositories.

3. Promoting the skill of self-reflection to improve self and professional practice teaches students to reflect on their skill sets and may involve drawing attention to their strengths as well as areas that they lack both confidence and capabilities (Bridgstock 2009), including identifying skills sets that students may not see being developed during academic study. Reflection may assist to enlighten students to future-oriented industry skill needs. By demonstrating to students what they are learning, when they are learning it, preliminary research suggests that this helps to foster skill development and understanding which directly impacts on a students work readiness (Mellors-Bourne et al. 2011). The role of reflection has increasingly been a point of research and is now often embedded in courses and industry pathways (Carrick Associate Fellowship Project 2008; Falgares et al. 2017). On a broader university-based level, institutions such as Monash University are complementing traditional academic studies with platforms such as *Student Futures,* a platform which promotes the role of reflection to assist students in articulating their skill development, and to enable them to enter the workforce ready to practice, as is being completed in engineering streams (Green et al. 2019).
4. Online courses could offer greater consideration and attention to the outside-of-study experiences of their student cohort, which includes substantial work experience, and/or the opportunity to apply learning of industry skills directly. Rather than allowing differences between these students and students who do not have this work experience to divide the cohort, there could be opportunities offered via discussion forums or online classes that allow the more experienced to share with the less experienced. In this way, pre-professional identity development could be fostered prior to students leaving the educational environment, by permitting students to be exposed to and develop behavioural and cultural norms of their intended profession (Hamilton et al. 2017; Jackson 2017).
5. Use of non-placement work-integrated learning, which includes the use of virtual reality, role plays and peer networking through group projects, could enable disciplinary knowledge development in a non-threatening and supportive environment by integration into learning frameworks (Burke et al. 2009; Jackson 2017).

17.5 Conclusion

There are both specific and generic skills that a graduate is expected to possess in a modern world. Inherently, given the duality of what is expected, each unique industry

stream must be tailored. What the literature base suggests and where the majority of the research has focused is in the area of generic skills; however, further research is required as to how industry-specific skills are impacted by online learning. As described above, the mode of learning may not influence the extent to which work readiness is developed, given the nature of the interactive processes between both specific and generic skills that occur. What is important to consider is how students conceptualise and communicate their skills during their learning pathway which will enable them to be work-ready. Given the rich opportunities for skill development in the online environment, and the demographics of current online student cohorts, studying online may in fact be a better way to prepare for a modern workforce.

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Chapter 18
No Student is an Island—Students' Perspectives of Sense of Community in Online Higher Education

Emily Adam

Abstract The Australian Department of Education and Training statistics show that more students than ever are enrolling in online study (Australian Government Department of Education, 2019), a trend that is mirrored abroad (Grinder, Kelly-Reid, & Mann, 2019). Research also show that the majority of Australian students enrolled in online programs are mature-age students (Norton, Cherastidtham, & Mackey, 2018). The increased popularity of online programs, especially for mature-age students, likely reflects the need for students to fit their study around the competing demands of work and family life. Whilst online courses offer students increased flexibility, they also present a challenge when it comes to building a sense of community. Higher education research shows that sense of belonging and community in higher education is positively associated with academic performance, self-confidence, engagement, retention, and satisfaction with the university experience (Freeman, Anderman, & Jensen, 2007; Chang & Smith, 2008; Hausmann, Schofield, & Woods, 2007; LaPointe & Gunawardena, 2004; Liu, Magjuka, Bonk, & Lee, 2007; Ouzts, 2006; Rovai, Wighting, & Liu, 2005; Strayhorn, 2012; Swan, 2002; Thomas, Herbert, & Teras, 2014). Conversely, feelings of isolation and alienation among online learners contribute to learner dissatisfaction and attrition (Rovai, 2001; Schaeffer & Konetes, 2010). This chapter will describe the challenges faced when building a sense of community for fully online students and outline strategies to address the unique challenges faced in a fully online program.

18.1 Is There a Lack of Community in Online Education?

Sense of community is defined as "a feeling that members have of belonging, a feeling that members matter to one another and to the group, and a shared faith that members' needs will be met through their commitment to be together" (McMillan, Chavis, & Newbrough, 1986, p. 9). As an educator in a large graduate psychology program, my interest in looking at community stemmed from informal conversations

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with students about their experiences in our course. In conversations with students, they emphasised the need for flexibility with study, but also expressed a sense of isolation and loneliness. Following these conversations, I was interested in whether (1) sense of community in online programs is lower than traditional face-to-face programs, and (2) whether there are specific formal and informal learning activities that facilitate sense of community online.

Based on the current literature, there is some evidence that online students report lower levels of sense of community than those studying in traditional face-to-face programs (Drouin & Vartanian, 2010; Olges, 2013; Rovai et al. 2005; Wighting, Liu, & Rovai, 2008). However, Drouin and Vartanian (2010) found that despite online students reporting lower levels of sense of community, both face-to-face and online students reported feeling satisfied with their current levels of sense of community. Based on these findings, it may be the case that students who choose to study online require less connection and sense of belonging. Alternatively, they may not have the time to engage with activities designed to enhance sense of community, or they many not see the value in these activities if they are time-poor and need to prioritise tasks.

Several studies have examined the strategies and activities used to build a sense of community online, capturing both educator and student perspectives (Shackelford & Maxwell, 2012; Thomas, Herbert, & Teras, 2014; Witzig, Spencer, & Myers, 2017). The common strategies and activities that emerge about effective community-building include.

1. The use of real-time interactions through virtual classroom software, and the ability to review virtual class recordings at a later date, or if the student cannot attend.
2. Creating opportunities for students to introduce themselves to the class. For example, through discussion forums where students make individual posts where they introduce their background, career goals, etc.
3. Peer-teaching activities. For example, where students work either individually or as a group to present content to the group.
4. Ensuring that online students have access to the same resources as on-campus students (e.g. library resources, etc.).
5. Embedding collaboration into assessment (e.g. low-stakes group assignments, etc.).
6. The use of ice-breakers either in discussion forums at the beginning of the teaching period, or in the first class.
    a. Professional ice-breakers: An activity where students discuss their professional backgrounds and their goals for future careers with their current course.
    b. Geographical ice-breakers: An activity where students post a google maps screenshot of their city/town.
7. Relationship and rapport building with online instructors. For example, through the use of instructor photos and bios, or instructor introduction videos.

8. The use of social media platforms such as Facebook and Linkedin to create online learning communities.

Although we used the majority of the strategies listed above in our fully online program, our informal conversations with students indicated that there was still room for improvement with building community. Following these conversations and a review of the current literature, we ran a research study to ask our students whether a sense of connectedness was important to them, how much time they had to connect with others in the program and what types of formal and informal activities currently available in the program increased or decreased their sense of connection.

18.2 Students' Perspectives of Sense of Community in a Fully Online, Intensive-Mode Program

We advertised the study on our course Moodle sites and students participated by completing an anonymous online survey. Our final sample consisted of 97 participants and the average age of participants was 39 years ($SD = 9.90$). Participants were mostly female (86.6%), followed by male (12.4%) and androgynous (1%). Half the sample had no dependents (50.5%), followed by two dependents (21.6%), three dependents (15.5%), one dependent (11.3%), and four dependents (1%). Of those with dependents, the average number of hours per week spent caring for dependents was 47 h ($SD = 31.95$ h). They were mostly either employed full-time (29.9%) or part-time (28.9%), followed by self-employed (12.4%), parents (9.3%), students (8.2%), casual employees (5.2%), other (3.1%), or unemployed (3.1%). If employed, the average number of hours per week worked was 29.97 h ($SD = 12.91$ h). On average they spend 28.35 h studying per week ($SD = 11.34$).

To measure the sense of community we used the commonly used Classroom Community Scale (Rovai, 2002). The scale produces a total score, plus scores on two subscales: Connectedness and Learning (Learning reflects the degree to which involvement in the community contributes to learning and the learner's goals). The possible range for the total score is 0–80, and 0–40 for the two subscales. The average level of community in our sample was 45.46 ($SD = 11.64$) for the total scale, 24.82 ($SD = 7.27$) for the learning subscale and 20.65 ($SD = 6.68$) for the connectedness subscale. These averages are lower than previous studies examining the sense of community in online learning environments (e.g. Shea, 2006; Rovai, 2002). For example, Rovai (2002) assessed sense of community for 375 students enrolled across 28 online courses, each which ran for 16 weeks, and reported higher averages for the total scale ($M = 56.62$, $SD = 12.30$), the connectedness scale ($M = 26.45$, $SD = 7.23$) and the learning scale ($M = 30.17$, $SD = 6.51$). These lower averages for a sense of classroom community in our study could result from the intensive nature of our online program compared to the longer course duration for the students in the other studies. In our program, students may not have as much time to spend on building connections with others outside of the formal learning activities

and requirements of the course. Alternatively, it could be that students studying in an intensive-mode, fully online course place less emphasis on connection with others. In addition to the classroom community scale, we also asked students about their need for connection with others in the course, and how much time they had to socialise with others in the course.

When asked how important it was for them to feel connected to other students in the course, the majority said it was moderately important (36.1%), followed by very important (27.8%) and extremely important (23.7%), slightly important (7.2%) and not at all important (5.2%). When asked how much time they had to socialise with other students, the majority indicated they only had a little time (53.6%), followed by none at all (30.9%), a moderate amount (12.4%), a lot (1%) and a great deal (2.1%). When asked how much time they had to socialise with instructors, the majority said a little (48.5%), followed by none at all (36.1%), a moderate amount (13.4%) and a lot (2.1%). No students reported they had a great deal of time to socialise with instructors (0%).

These findings highlight the challenges faced by students and instructors when attempting to build community in an intensive-mode, fully online program. On the one hand, students feel it is important to feel connected to others in the program, but on the other hand, they have very little time for the type of socialisation that could lead to enhancing the sense of community. To determine what types of activities currently available in our program led to increased sense of community, we also asked students to rate different types of formal and informal learning activities on how connected they made them feel to others in the program on a scale from 1 to 10. As can be seen in Table 18.1, the activities that made students feel most connected were synchronous interactions with instructors and other students, along with student-created and moderated Facebook groups.

We also asked students if there were other informal or formal learning activities not listed that increased their sense of community in the program. The most common response to this question was 'group assessments' (43%), a program-facilitated facebook group (38%), emails with instructors (14%) and Moodle forums (5%). The research with our students showed that the majority of students reported that group assessments helped to increase their sense of connection. For example, students commented that.

> Some particular assignments that we have done in pairs or group had some off-moodle communication going which was helpful in connecting with other students.
>
> Group work- small easy assignments working with others was a great way to connect i.e. the group presentation in development psy4131.
>
> Having just done a group oral presentation, the extra meeting times to discuss and prepare also helped with putting us in touch with fellow students.
>
> The group oral presentation was actually quite pleasant and created a sense of connection.
>
> The group task in one of the modules was good because I had to speak to two other students to coordinate stuff.

Altogether, the research with our students highlights both challenges and opportunities for online educators, especially those instructing intensive-mode courses, and

Table 18.1 Student ratings of learning activities based on the degree of connectedness

Type of learning activity	Mean	Std. Deviation
Virtual classes (synchronous)	7.01	2.28
Office hour (live consultation time where students can ask questions)	6.81	2.37
Facebook (these are student-created and moderated Facebook groups outside of the course)	5.70	3.76
Senior instructor live chat (live consultation time with a senior teaching member where students can ask questions)	5.68	2.94
Assignment feedback	5.11	2.75
Discussion forums	4.89	2.41
Student success/Support	4.42	2.46
Skills workshops	3.88	2.42
Coordination team announcements	3.81	2.26
Moodle activities	3.72	2.25
Lecture videos	3.55	2.62
Class recordings	3.55	2.35
Study groups	3.32	2.71
Yammer	2.37	2.08
Textbook	2.35	2.026

can inform the educational design and delivery of online higher education programs that foster a sense of community.

18.3 Reflections and Recommendations

Whilst online programs offer students increased flexibility for learning, the online student is often juggling competing life demands and therefore has little time to engage with informal learning activities designed to increase sense of community. Our own research demonstrated that most students felt that sense of community was important, but that they had little time with which to engage in informal learning activities designed to enhance sense of community. One interpretation of this finding is that the challenge to building sense of community in online programs is not the mode of study, but rather the online student demographic who are time-poor because of work, life and study commitments. To address this challenge, community-building needs to be embedded in formal learning activities. As highlighted by the feedback from our students, low-stakes group assessments are a great way to embed community-building in formal learning. The collaborative nature of the work, and the opportunity to meet outside of the regular-scheduled classes led to an increased sense of connection for our students.

The findings from our research also suggest that social media creates an opportunity for students to connect. Many of our students reported that Facebook provided a platform for students to connect, support and motivate each other. Some of the advantages of social media platforms, like Facebook, are that students often already have accounts on these platforms, and are thus familiar with using the platforms. This familiarity with the platforms makes it easier and more accessible for time-poor students to engage and connect with others. Witzig, Spencer, and Myers (2017) provide a range of recommendations for the use of social media, including Facebook, in higher education. In addition to these recommendations, the authors argue that Linkedin is a 'must-do' for any online program because the platform appeals to the older demographic of online students and assists students to build professional networks for their careers after graduation. Based on our own research findings and these recommendations, we now have a course-facilitated Linkedin group with active engagement from both students and staff. In the Linkedin group, our students share job opportunities, professional development opportunities, and updates on their career progression after graduation from our program.

Lastly, the research with our students highlights the importance of synchronous learning activities, such as virtual classes, as an opportunity for community-building. To leverage this opportunity, synchronous learning activities need to maximise opportunities for student interaction and class-led discussions (Swan, 2002). In our own program, we have made changes to the way we run our virtual classes, including dedicating a short amount of time to informal conversation at the beginning of each class, and increasing the number of student-led class activities.

We expect that these efforts to engage students with their peers and instructors are likely to increase student engagement and retention, academic performance and satisfaction with the university experience.

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Chapter 19
Is It Time to Create a Hierarchy of Online Student Needs?

Jennifer Chung and Stephen McKenzie

Abstract Online education is becoming widely accepted in tertiary education including by academics, students and employers. Educators have created new and innovative ways of teaching curriculum to online students that produce academically and employable equivalent graduates. In response to this success, we believe that it is time to shift our online attention onto creating a student experience that is equivalent to the entire on-campus experience, and increasing student well-being, success and satisfaction. In this chapter, we introduce a model of an online education hierarchy of student needs—a novel adaptation of Maslow's hierarchy of needs. Online education is closing the gap between academic equivalence of on-campus and online education, and we contend that the next phase of meeting online student needs includes addressing academic and general well-being, and a strong sense of community, connection and belongingness, which may eventually result in online self-actualization. We describe the importance of student well-being, provide an example of a mindfulness well-being component of a large online course and discuss how a student's sense of community, connection and belongingness is impacted on by their fully online education world. In this chapter, we explore what should be next on the online education agenda and what needs to be done to *really* achieve online–on-campus equivalence.

19.1 Introduction

Providing high-quality academic resources and state-of-the-art technology to deliver online education is essential to achieving optimally successful online education;

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however, there are other aspects of optimal online education which are less obvious, and which are becoming increasingly important as online education advances. Although online education is expanding worldwide, some traditional educators and lecturers question the broad equivalence of online education, including work-ready skills and employability of graduates from online programmes. With this in mind, many online educators are working to address misconceptions about the non-equivalence of online education and ensure that the education that online students receive is equivalent in all ways to traditional education. Furthermore, efforts are constantly being made such that students studying online are as fully educationally equipped in all ways as students studying on-campus. Creating fully equivalent academic experience has predominantly been at the forefront of online educators' agenda thus far, and perhaps rightly so. However, is it now time to shift our focus and attention to creating a truly equivalent, and broadly valuable experience for students studying online? We would argue, yes.

Students who are studying in a traditional on-campus mode are exposed to and given the opportunity to take part in a number of social, non-academic and well-being related activities. Typically these resources or activities are organised by both the university and by student associations or groups. Aside from organised events, on-campus students are also exposed to many impromptu and serendipitous experiences—for example, sitting next to someone at a lecture can lead to ongoing friendships, peer assistance and co-learning, professional networking opportunities, and more. It is widely recognised that students attend university for their academic benefit and to further their education. However, in addition to this core value of attending universities in the traditional mode, students gain important intangible life benefits that may contribute to their general and academic well-being, sense of connection and community, sense of purpose and sense of identity.

Unfortunately, it seems that for students studying online, educational intangibles such as well-being and connection are not widely recognised or seen as being important. Has the time, therefore, come for online education to advance to the equivalent to the next stage of Maslow's hierarchy of needs (Maslow, 1943)? Maslow's basic physiological needs (e.g. water, shelter, sleep) could be seen as equivalent to high-quality academic materials that are the basic online student's needs. Now that these basic online education needs are being widely met is it time to advance to the next levels of the hierarchy, towards the need for online academic self-actualization—consisting of a strong sense of well-being, connectedness and community? Our online education adaptation of Maslow's hierarchy of needs is depicted in Fig. 19.1.

We contend that fostering a fully equivalent and deeply valuable university experience for students studying online must include addressing: student academic well-being, general well-being and feelings of connectedness and belongingness with their peers, academics and the wider university community. In this chapter, we focus on the next level of online education student needs above academic needs (Fig. 19.1). We discuss the importance of student well-being, provide an example of how universities can offer valuable well-being resources for their students, and the importance of recognising and addressing students' feelings of community and connection—all within an increasingly broad online learning context.

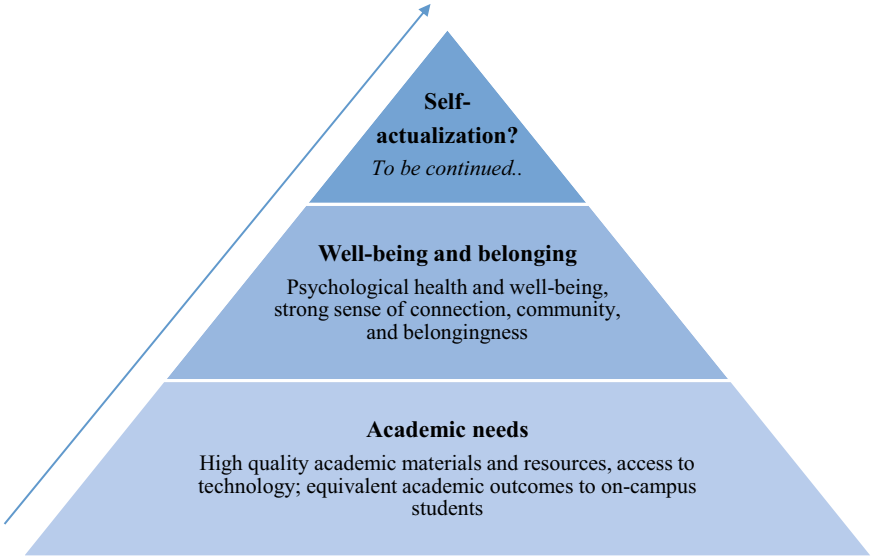

Fig. 19.1 Diagram of the online education hierarchy of student needs

19.2 Well-Being in the Online World

Research has reported the growing incidence of students with poor mental health and well-being, and increased stress and emotional health problems, including in comparison to the general population (Stallman, 2010; Storrie, Ahern, & Tuckett, 2010). In addition to study-related stress, students studying online are typically also juggling multiple other stressors and responsibilities such as full-time employment, and caring for families or children (Colorado & Eberle, 2010; Johnson, 2015). When these additional factors are combined with the physical isolation and distance between these students and their peers, instructors, administrators, and university staff—online students are at greater risk of not receiving the support they need to reduce their likelihood of increased stress and decreased well-being.

At most university campuses, non-academic support services and resources are offered free of charge to students. For example, universities often offer free on-campus counselling services, well-being enhancing activities such as mindfulness practices, student advocacy and financial assistance. By simply walking around campus, students are exposed to posters advertising the availability of these and other broad student support resources. In comparison, studying in a fully online mode without access to the physical campus immediately reduces the likelihood of students accessing these resources, particularly as many of these resources are only offered on-campus.

19.3 Case Studies of Well-Being and Other Resources for Online Students

To achieve the next level of the hierarchy of online student needs it is necessary to recognise that meeting students' non-academic needs is now essential to their achieving optimal and optimally equivalent online education. An example of introducing well-being improving resources into online education is presented here. The School of Psychological Sciences (SoPS) at Monash University, Australia, incorporated and piloted a mindfulness for well-being component of its large new online fourth-year psychology course, the Graduate Diploma of Psychology Advanced (GDPA). Mindfulness is a technique that is commonly used to enhance well-being and decrease stress that has been widely used and strongly supported by research evidence as a non-invasive and non-stigma provoking intervention (Ma & Teasdale, 2004; McKenzie & Hassed, 2012). In university students, mindfulness has been positively associated with improved academic performance, and also improvements in stress levels, depression and academic anxiety (Hassed, De Lisle, Sullivan, & Pier, 2009; Hjeltnes, Binder, Moltu, & Dundas, 2015; McConville, McAleer, & Hahne, 2017).

A selection of mindfulness exercises was created specifically to be incorporated in the GDPA course's Learning Management System (LMS) for students to complete at their own pace. These resources consisted of six short, guided audio mindfulness exercises, all of which were presented by a mindfulness expert and researcher, SM. This pilot programme was recently evaluated in a joint online education research project between Monash University and King's College London. In this study, the online mindfulness activities were provided to both online and on-campus students in disciplines including psychology, neuroscience, public health, business and IT, over a period of 6 weeks for online students and 12 weeks for on-campus students, matching the lengths of their teaching semesters (Coxon, Dyer, McKenzie, & Chung, 2019). It was found that, overall, students enjoyed and found benefits in practicing mindfulness during the research study's time period, such as increased awareness of the present moment. The participants provided constructive suggestions to improve future iterations of the program. Results of this pilot study have revealed that students who were exposed to the mindfulness exercises experienced a lower level of stress at the end of their study period, compared to their student counterparts in the control condition (Coxon et al., 2019).

A second generation and iteration of the Monash University and King's College London online mindfulness for student well-being programme is currently being developed, and is part of a larger project creating a university-wide LMS-based orientation and on-going support site for online students. The second generation changes to the programme include lengthening the guided audio mindfulness exercises from approximately 2 min each to approximately 10 min each, providing the mindfulness activities in a variety of formats including video, written material and activities, as well as variations being provided in the presentation of exercises themselves (e.g. gender of narrator, narrator style). This resource will include a suite of academic

and non-academic student resources that will be used by and available to all online students throughout their studies. The site will be created for and offered specifically to online students at Monash University, a first at the university. The inclusion of online-based mindfulness programmes to enhance student well-being will provide greater reach and equivalence for students studying online and will enhance, promote and support student well-being.

More research is needed to fully evaluate the effectiveness of the online mindfulness activities provided for Monash University and King's College students—from the perspectives of enhancing the academic experience and as a wellness-intervention within the educational environment. A range of research questions need to be addressed by further research into the well-being and other benefits of mindfulness and other well-being enhancing online resources, such as:

- Are the resources targeting and reaching all online students?
- Are the resources being utilised by online students to help well-being?
- Are the resources being utilised by online students as a reaction to their decreased well-being and stress compared with on-campus students?

Although not solely focusing on student well-being and wellness, another example of the development and creation of an online orientation programme for online students has been described in a case study by Horvath et al. (2019). Horvath and colleagues recognised the need for increased student preparedness and ongoing support for students within their fully online nutrition course that launched in 2015. Their approach to the development of their online orientation site included surveying students to understand personal and external factors they believe impacts on their studies, as well as confidence in using technology to study. Based on their survey findings, Horvath and colleagues' created a "Plan, Prepare and Connect" LMS site that includes resources, videos, step-by-step guides and online interactive sessions. Their orientation site focuses on topics such as setting up course and career expectations, student preparedness for online study, organisation and time management, confidence with technology and communication and sense of community. In addition, students are invited to complete screening questionnaires on health and well-being, and technology as well as attend live sessions with support staff and student peer leaders (Horvath et al., 2019).

To the authors' knowledge, there are very few non-academic, online, support resources provided to online students, or at least very few that have been documented in literature to date. Although not specifically targeted or offered to online students, web- and app-based well-being resources have been investigated in the recent research literature. Papadatou-Pastou et al. (2019) explored the feasibility and acceptance of a tailor-made online well-being and study support skills system, "MePlusMe". This system was targeted to students who presented with mild or moderate mental health difficulties (Papadatou-Pastou et al., 2019). Ray, Arpan, Oehme, Perko, and Clark (2019) investigated the effects of an online wellness-intervention and found that students who were exposed to the intervention reported high self-efficacy and a greater likelihood of engaging in self-help activities and utilising on-campus resources. To our knowledge, both systems and interventions

reported by Papadatou-Pastou et al. and Ray et al. were not integrated into the students' LMSs.

In this section of the chapter, we discussed the importance of and provided examples of resources targeting student well-being and wellness. Students who are studying on-campus are offered the opportunity to take part in and receive support from services to better their well-being or help them handle study and academic stresses. Currently, students who are studying online without access to a physical university campus are unfortunately likely to not receive support resources that will help them reach the higher stages of online self-actualization, and develop personal as well as academic well-being.

19.4 Building Communities Within the Online World

Another important aspect of creating real equivalence between online study and on-campus study, and the greater student experience that can be even more challenging to address, is how to best achieve a real experience of online student community and belongingness? On-campus equivalent online connectedness and community could be seen as accompanying student well-being needs in the next stage of the online hierarchy of student needs (Fig. 19.1), and the challenge is how online educators can recognise and then climb this online step.

Humans thrive on interaction, engagement and support from the people who they interact with. Connectedness is a key component of the human wisdom traditions that underlie Maslow's hierarchy of human needs psychological and philosophical construct (Maslow, 1943), as well as our online education hierarchy of student needs construct. "A human being is a part of the whole, called by us, 'Universe,' a part limited in time and space. He experiences himself, his thoughts and feelings as something separated from the rest—a kind of optical delusion of his consciousness." Albert Einstein. Primary and pre-school aged children thrive on social interaction that is necessary for their optimal learning of social skills, which require the development of an understanding of other people's world view, and of how our behaviours can influence other people's behaviours (Weinstein & Bearison, 1985). In the workplace, teamwork and working collaboratively can help with the generation of new ideas, the exchange of ideas, and fostering of creativity (McKenzie, 2015). These examples demonstrate the importance and positive influence of being connected with other people, particularly like-minded people.

In the education setting, research shows that there are positive associations between feelings of a strong sense of community, belongingness, and connectedness with peers and increased engagement, academic success, decreased loneliness, increased satisfaction and overall learning experience (Dolan, Kain, Reilly, & Bansal, 2017; Sadera, Robertson, Song, & Midon, 2009; Vesely, Bloom, & Sherlock, 2007). What happens, however, when those 'around' us can't be physically contacted and we can't necessarily see or hear them? This is what it can be like for students studying online.

Online education often claims that its asynchronous nature is an advantage, however, there are drawbacks to this flexible feature as well. Students have less or limited time to connect in real time with their peers and instructors, which reduces their intangible chances of building a strong network and feelings of connectedness. This is one of the key challenges in creating a holistic student experience in online education, and one that needs to be addressed and the progression up the hierarchy of online student needs will be our next great online education challenge. An approach to meeting this challenge via increasing online students' sense of community is provided in Chap. 18 of this book, Adams (in press).

19.5 Reflections and Recommendations

Online education is widely becoming accepted as providing on-campus equivalent educational materials and producing academically equivalent graduates. However, an important and relatively unrecognised aspect of the evolving online education world that is yet to become online equivalent is the full student experience. Students studying online without access to a physical campus are not yet provided with on-campus equivalent ease of access to services and resources that can accompany and promote real student well-being and a sense of connection and community; both of which are positively associated with academic success and engagement, and with overall student satisfaction (Liu, Magjuka, Bonk, & Seung-Jee, 2007; Stallman, 2010).

We recommend that universities that are providing online education—or are looking to provide online education in the future—attempt to replicate or provide alternative comprehensive online resources for online students that will not only assist their educational success, but provide an optimal whole university experience. The real challenge is, of course, to provide an educational experience for online students that is fully transferable, scalable and equivalent to the on-campus whole student experience. This might be a difficult challenge, however, it is one that we must face in order to *really* achieve online—on-campus student experience equivalence.

So, in answer to our question—"Is it time to create an online hierarchy of student needs?"—we have argued that it is now vital that we attend to online students' full range of needs, far beyond their need for academic equivalence. The recent rapid expansion of the need for online education in response to Covid-19 has re-enforced the need for TOTAL online education. It is time for online course educators to fully acknowledge that students' well-being and sense of belongingness and connectedness are key factors in ensuring a well-rounded online university experience that produces life successful as well as academically successful graduates. It is time for online students to realise what their online education really can be and needs to be. We must take action, now, to ensure that the full needs of online students, who we can't always see or hear, are realised and met.

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Part III
Online Education Examples

This final part of the book provides the proof of the online education pudding—the experiences of online students, teachers, developers and administrators. A wide range of online education experiences are presented here, from a wide range of online education participants, which add a personal dimension to our evolving online education knowledge. The chapters in this part of the book will help people who are new to online education and also people who are experienced in online education see the reality of what the online experience really consists of and can consist of, from a wide range of perspectives. This individual practice-based knowledge adds a valuable dimension to theoretical and research-based knowledge that is deeper and more deeply valuable than the assumption that online experts are always telling us the online truth, the whole online truth and nothing but the online truth. The experiences of online education users, teachers and developers will help future online education users, teachers and developers optimally use, teach and develop content for this exciting new medium. There are as many online user experiences as there are online users, and that number is growing rapidly; however, this part of the book helps reveal a universal and universally valuable online education story.

This part of the book is divided into -

Online Learning and Teaching examples, which feature an interview with a well-known psychologist and education expert on deep learning (Chap. 20) and individual perspectives from online students, teachers and developers (Chaps. 21–26).

Online Research examples, which feature the online research supervision experience (Chap. 27) and the development and implementation of an international online education research program (Chap. 28).

Online Design and Delivery examples, which feature delivery as an act of design (Chap. 29), design thinking in converting on-campus course to online delivery (Chap. 30), the design, development and participation in a large new mindfulness MOOC (Chap. 31), online design and delivery for corporate training (Chap. 32) and the development and implementation of an online education supporting Community of Practice (Chap. 33).

Chapter 20
Back to the Education Future—Deep Online Learning Opportunities

James Flynn, Stephen McKenzie, and Jennifer Chung

Abstract We have moved past the point of online education return. Online education is here, no matter what we think of it, and we need to consider how we can plan and implement an online education paradigm shift that optimises our use of our brave new education medium. We need to work out how online education can be as equivalent as possible to traditional education, academically and also intangibly, and this book is here to help us move in this direction with its descriptions of optimal online education innovations, student-centred learning and examples. We have explored how online education can be made equivalent to and even better than on-campus education academically, such as via integrated and multi-modal learning that naturally includes the optimal educational use of VR and AI. We have also explored how online education can be equivalent to and even better than on-campus education intangibly. This can be achieved including via the use of online education communities and orientation support sites that can give online students a broad education success that includes optimal engagement, connectedness and well-being. We will now explore in this chapter how online education can use its position as the new leader of the education pack to lead us back to deep educational value.

This chapter is based on an interview conducted with Prof. Flynn on 2 February 2017.

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20.1 Introduction

The demand for and potential benefits of tertiary education is growing rapidly, for reasons including the growing need to meet the educational and professional needs of the world's rapidly growing middle classes, and the increasingly higher technical and specialisation requirements of twenty-first-century jobs. For example, in 2015, 1,410,133 students were enrolled in higher education institutions in Australia. In comparison, in 1985, the respective enrolments were 370, 016 (Australian Government, 2016). This is an enrolment increase of over 280% in 30 years and the data demonstrates that this upward trend is likely to continue (Norton & Cakitaki, 2016). Internationally, it has been estimated (by FutureLearn) that world-wide there will be 13 million new tertiary students per year until 2030, and that 700 new universities a year will be required to support these new students if they physically attend university campuses. Online education is, therefore, vital for the expansion of tertiary education and its benefits, and we need to consider how online education can be as successful as possible, academically, and also more broadly.

Our brave new world of online education offers us exciting new learning and teaching resources including multi-media integrations, and integrated online workbooks, which allow online education to progress substantially from its first generation. Primitive online education often consisted of the passive transfer of traditional course content such as on-campus lectures, and textbook readings, into online courses. These early attempts at creating online course content can be seen as equivalent to early attempts at creating TV content that merely passively added pictures to radio content. There is a brave new world of online courses awaiting us that offers educators and educatees unexplored and unconsidered educational potential.

The great pioneering opportunities offered by online education paradoxically include a way back to the future of education, that give back education its traditional emphasis on student-centred learning—of deep and deeply transferable education and life principles—and return it from its recent emphasis on specialised, and limited, training. Because online education is relatively new it offers us a relatively new opportunity to give education back what it has lost from its traditional manifestations—a concentration on transferable learning that is made possible by the learning of universal skills—such as the development of critical thinking and evidence-based thinking. This will allow students and the society that they live and work in to stop learning and living in a 'post-truth age', that is the direct result of our new education Dark Age.

This TOTAL chapter is based on an inspiring interview with Professor James Flynn, that was conducted in his office in the University of Otago, Dunedin, 2 February 2017. Professor Flynn is a living legend of psychology who is famous for discovering the Flynn effect—since intelligence testing began people became progressively more intelligent—as measured by intelligence tests—or better at doing intelligence tests. The evidence for this which Professor Flynn identified and obtained is the phenomenon that since intelligence testing began in the early twentieth-century average scores on them have progressively increased, until recently. Professor Flynn

is also a great advocate for the restoration of deep and deeply useful learning, and he provides here a valuable and inspiring articulation of the deep and deeply valuable first principles that can lead learning back to its originally promised land, from its recent foray into a pragmatic education wilderness.

20.2 Interview with Prof. James Flynn

20.2.1 Deep Learning Challenges and Opportunities

I was born a Catholic and lost my faith at about 11 or 12, and that of course was good because they were about ready to send me to a high school for people who wanted to be priests, and I would've been unhappy there. But also it made me worry a great deal about the foundation of morality. If it wasn't based on divine authority, were certain ideals more objective than others? Let's say my humane ideals as compared to racist ideals, and that was a problem that preoccupied me for my whole scholarly life, and wouldn't let me go. I did publish two books on it eventually.

But I also, with my deep convictions about race, found it terribly upsetting when I ran into Arthur Jensen and found that a broadly educated man thought that the evidence, all considered, showed that blacks on average were genetically inferior to whites for intelligence. If I'd been afraid to go on to alien fields, I would never have tackled that problem, but it wouldn't let me rest. I was trained as a moral philosopher and that was it. I had to learn matrix algebra and look at IQ testing, and look at its history, and analyse the twin studies … But I couldn't help it. I wanted to find out. And then of course one thing led to another.

I discovered the Flynn effect, massive IQ gains over time looking at black and white trends over time. And then I found an enormous resistance in psychology because they had a theory of intelligence that essentially downgraded environment. So I was then trapped into writing the books with Cambridge on the theory of intelligence as well as the ones on race.

There's no way you can make a person intellectually curious who is not intellectually curious. They have to have certain problems that don't leave them alone until they've explored them and I don't know how you do that. That's up to the person. And curiosity: You can have enormous intelligence and only be interested in figuring out the odds for horse races. Some of the greatest scientists have had that intellectual curiosity, but have had the hubris or the pride that they didn't need to know anything but science. So you get scientists writing on fundamental problems and saying, 'Heisenberg's uncertainty principle proves there's such a thing as free will', or the fact the universe began with the singularity (as if it popped out of nothing) means that there might be a God. You have evolutionary biologists saying evolution shows the growth of human consciousness so that's the greatest good. So what you often have, among the very best scientists, is an intellectual curiosity but an arrogance that their special science is enough. Although they would never write a book

in physics without being acquainted with the literature, they're quite happy to write a book in philosophy, knowing nothing about moral philosophy or epistemology or the things you really ought to know. They end up either re-inventing the wheel or making obvious mistakes.

It's a combination of curiosity about fundamental problems, a broad education, and a historical and literary background that liberates the human mind. You also have to have the courage to criticise popular myths, for example, to go deeply into racial differences in cognition. If everyone who puts truth ahead of acceptability opts out, that is the best way of making sure that truth never makes its way. You leave the university and political arena to those who have been frightened into conformity. I am continually attacked by those who fear that even investigation of racial differences might turn up something unwelcome.

My career is a little bizarre, isn't it? While I do have a humanities medal from the New Zealand Royal Society for my contributions to philosophy, as you say, I'm far more famous for evidencing the Flynn effect in psychology. But, you know, I could've just been someone who measured the Flynn effect and then stopped: because I knew I would face enormous resistance if I went on to challenge the prevailing theory of intelligence, and if I stressed that the Flynn effect did not simply settle the race and IQ debate in favour of environment. Over the last 30 years, I have (grudgingly) spent only a third of my time on philosophy, lies about climate change, and tempting young people to read great literature. I spent at least as much time trying to force psychologists to do things they ought to do: adjust their theory of intelligence to give environment a proper role, honestly confront group differences, and what they miss by their separation of psychology from sociology. Not that I regret the work I've done in psychology. I take a certain pride in it. I was pleased to get an award for lifetime achievement by the International Society for Intelligence Research this year. And there has been a bonus: my reputation in psychology encouraged publishers to seriously consider that I might have something to say in other areas.

The greatest challenge facing us in practical terms is climate change. The next greatest challenge in my opinion is the narrowness of university education, particularly the fact that it is so narrow—it turns out narrow vocational specialists without a general education. The next book I write is going to be on the universities, all the pressures on universities to make them narrow in terms of how they educate young people, and narrow in terms of the views that are tolerated within a university. They need to shock young people out of their arrogance. Many young people enter university with a sort of adolescent wisdom that they know exactly what's right and wrong. They will do things like try and drive Arthur Jensen out of a university by saying he's a racist, we're going to bomb his lectures, we're going to beat up his kids. When in point of fact debating with Jensen has produced far more understanding of psychology than if he had been shut up.

Virtually everything I have done in psychology I owe to arguing initially with Arthur Jensen. Now later I argued with other people like Richard Lynn as well. If they had been shut up, I would have been like the students: a dogmatic commitment to equality, with a dogmatic belief that blacks are genetically the equal of whites without looking at the evidence. Even in the area of climate change, I am glad there

is free debate. As I say in my book, *No Place to Hide: Climate Change a short introduction,* the climate change critics have done us a service. They forced us to make a far more complete case for climate change than we probably would have ordinarily.

I know how insecure the careers of young academics are. I don't expect anyone to fall on their sword and die on the altar of truth. If you're in an intolerant department play the game until you get tenure. Then you can do what you want. I mean if you're in some stupid philosophy department infected by post-modernism, write gibberish articles that mean nothing until you get tenure, and then do some solid philosophy.

The last word has not been said in philosophy. Its problems are perennial. We have not exhausted the problem of free will, we have not exhausted the problem of the true status of ethics, we haven't exhausted the problem of scientific realism, that is, whether science gives us a picture of reality. Now I'm talking like a philosopher!

20.2.2 Deep Research Challenges and Opportunities

There is no extraordinary research career without one of two things. First, that you happen to be incredibly good at something. You can invent a new technique for helping people who have heart diseases or an artificial heart. Second, you are the kind of person who thinks about certain problems that don't let you sleep at night. And therefore, you are driven to accumulate the knowledge you need to clarify them.

The history of intelligence, of cognitive ability, is a field that suffered from too many social scientists accepting dogma based on too narrow an education. They had abandoned what C. Wright Mills called the 'sociological imagination'. Only when psychology is married to sociology can we clarify certain problems. Let me just give you an illustration. There are tests like the Minnesota Multiphasic on which if a woman has a negative attitude towards marriage, this is taken as a sign of possible psychosis. Black women turned out to be much more psychotic than white. Well I wrote something [based on sociological research], which concluded that a black woman would have to be a raving romantic to have a positive attitude toward marriage. For every 100 black women of marriageable age there are only 57 functional men. Half of black women are faced with either having a solo child, or being married to someone who is in and out of jail, or who has AIDS, or is on drugs, or is intermittently unemployed. How in the world would you have a positive attitude towards marriage in such a marriage market? It's a 'white woman's question'. It probably is a bit unusual (though hardly a sign of pathology) if a white woman had a negative attitude towards marriage: because white women have a marriage market that contains almost as many white men who are as viable as most women are.

In my 2012 book, *Are We Getting Smarter?*, I have a last chapter on the sociological imagination, which lists 12 [research] areas that were mishandled, because of a lack of the sociological imagination. Not just tendencies to psychosis, but assessing the relative intelligence of women, reductionism and physiology, and god knows what. There are plenty of problems out there, but you have to be educated to see them.

20.3 Conclusion

A take online home message from this interview and from this book is that online education is a great new opportunity for educators and the educated to move backwards, to first education principles of deep and deeply life relevant learning. Online education is also a great opportunity for educators and the educated to move forwards, to new education principles, by using a combination of insight, creativity and reason to evolve an optimal online entity that has a heart as well as a reason. Now is our best and only opportunity to not lose the deep education forest in the online decision trees!

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Professor James Flynn is a legend of Psychology and Education and an Emeritus Professor of Political Studies at the University of Otago in Dunedin, New Zealand. As well as being famous for discovering the Flynn effect—intelligence or at least intelligence test scores increased in the 20th Century -. - Prof. Flynn is an international expert in education, and an important advocate for its return to deep and deeply valuable first principles.

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Chapter 21
A Student's Perspective—What Makes a Good Online Student?

Penelope Lovegrove

Abstract There is an absence of literature from a student's perspective on the experience of online education. With the increasing popularity of online courses, their rising costs, and the increasing prevalence of higher level courses, a deeper understanding of the online student experience is vital for achieving high-quality educational experiences and outcomes. Being old enough to have experienced an array of study modes, including studying by correspondence before the Internet became a household utility, as well as traditional on-campus learning and now online learning, I feel I am well-placed to provide an online learning student's perspective. Online learning has made tertiary education feasible for people living remotely, those with disabilities, people with parenting or caring responsibilities, or having to remain in employment while studying. For me, this flexibility meant I could pursue my career dreams without compromising my parental responsibilities. This chapter provides a student's perspective of online tertiary study, highlighting three components that I believe are necessary for success: organisation, engagement and support. While these components are requisites for all learning modes, they take on further meaning when applied to online learning.

21.1 Introduction

In this chapter, I will describe through the lens of my experience the importance of having a good online environment, how organisation and planning help to make studying less stressful, and how flexibility is the key to success for students with competing demands. I will also discuss from a student's perspective the pros and cons of synchronous and asynchronous learning, discussion forums, unmoderated chat rooms, and social media pages, as well as the value of personalised support. The chapter is intended to serve as a guide for current and future online students on how to make the most of their online learning experience, as well as offer a glimpse of what it is like to be an online student to educators and educational institutions.

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21.2 Organisation

In my experience across various platforms of remote learning, the essential attribute that is needed to make online education successful is good organisation. For an Institution offering online courses good organisation is needed to create an excellent online environment. For the online student, the online environment becomes your campus, replacing the classroom, library, research lab and lecturer's office. Perhaps even the study hall or student lounge. University campuses are notorious for being difficult to get around. Having worked or studied on-campus at five different universities, I know I am not alone when I say I have been thoroughly lost on at least one occasion on all five of them. A good online environment circumvents this problem and offers advantages over on-campus learning—no need to wander up and down hallways looking for lecture theatres or wasting time trekking between the library and the lab. All are now at your fingertips, or at least it could be if the Institution has invested in their online environment, and taken the time to tailor it to the specific needs of their students. It can be time-consuming having to click through multiple files and buttons to get to the information you need. Having quick access buttons to things like due dates, library resources, student notices, and links to the virtual classroom make navigating the online campus so much easier. For me, I had small, very rigid windows of time within which I could study, which meant that when I sat down to learn the last thing I needed was to waste time looking for the information I required.

For the online lecturer, good organisation means ensuring all materials are up to date and available before the course commences and knowing what is required of the student and when. It is beneficial if the lecturer conveys an understanding of where the trouble spots may be throughout the term and provide suggestions for how students may manage this. For example, if Week 4 has an unusually long list of required readings, it helps to let students know this so they can better manage their time. Some of the best lecturers I have had were the ones who also coordinated the unit because they knew the material intimately. They knew exactly what they were asking their students to do and how much time they would need to commit to do well.

In my experience, even with the most careful planning, children can be sick or need us in many other ways, usually about the time the assignment is due. It is useful knowing exactly what you need to do and have all the primary resources at your fingertips during these times so that you can use what time you have to at least pass. Marking rubrics shone like beacons in the dark of night when they were introduced. Online lecturers should provide all the material the student needs to do well in their assignments and should let them know that they can complete the tasks using those resources alone. Links for further resources should be provided for students who want to do extra well. You may think this is 'spoon feeding' students rather than getting them to do any heavy lifting, and in some sense it is. However, life can be unpredictable at the best of times.

This may seem like rudimentary advice—and it is—but many students have chosen online study because it fits around other commitments, such as work or parenting. This is not to say that on-campus students are not also managing juggling acts, but it is more likely that the majority of online students need a really well-organised study unit and a lecturer who understands that the study load is exponentially important. Personally, knowing important dates and busy periods in advance so that I can submit assignments on time and still attend my son's solo performance at the school concert is paramount. On one occasion, when exam dates kept changing and materials were uploaded only the week before, I struggled to keep all the balls in the air. The resulting guilt of letting my family down weighed heavily on my shoulders; I didn't study well and turned in assignments I was ashamed of—they were far from my best work. I spent weeks worried that this would impact on the mark required for post-graduate study. Other online students may be working around important, immovable deadlines for client projects or the end of the financial year. These commitments are, without doubt, equally as stressful—particularly if one's income is tied to meeting these deadlines. So, rudimentary as it is, if forgotten these fundamentals can have big consequences.

Likewise, studying online may require more organisation on the part of the student for the reasons mentioned above. The online study schedule may need to be more flexible and have contingencies built in to accommodate life's little catastrophes. Mapping out the academic term alongside competing demands is an excellent start. One online student I met completed their assignment three weeks early because the due date fell at the busiest time of the year for them. However, this sort of flexibility may not be achievable in every circumstance, so it is worthwhile for online students to speak to the lecturer at the beginning of the unit to see if due dates can be changed.

21.3 Engagement

21.3.1 Asynchronous Study

Before the advent of the Internet, asynchronous study was all that could be offered to those unable to attend classes on campus. If you were lucky, the distance education pack came to you with a grainy video tape of your lecturer reading verbatim from the prescribed text. We have come a long way since then, and asynchronous study has become much more engaging, often incorporating links to online videos, taped lectures, virtual libraries, and YouTube vignettes, all of which help to reinforce the teachings.

Asynchronous study is still largely a passive experience and does not suit all personalities and learning styles. The flexibility of learning anywhere, anytime and anyhow is not for everyone. It requires a great deal of self-motivation and discipline. If you are the type of person who is easily distracted by housework, day-time television (or night-time Netflix), text messages, emails and cat videos then you may struggle to

complete online modules on time. Ask yourself honestly—are you the type of person who prefers working in groups, or do you do your best work by yourself? Personally, I am somewhere in between. I prefer to work on my own and can be highly motivated if the task interests me. At the same time, it is astounding how clean the house can be when I'm procrastinating. I've since learned to recognise these moments and take myself to a café with my laptop and noise-cancelling headphones. It took a concerted effort over some time to get into a good study routine, but I would say that teaching myself to be self-motivated contributed significantly to my success as an online student.

Studying asynchronously also leaves us vulnerable to misunderstanding. Have you ever misinterpreted an email or text message? It is easily done. I saw a cartoon once, which showed a teacher at the front of the classroom, advising students to 'Take a seat'. One student can be seen walking out the door with a seat folded up under his arm. On the one hand, this kind of open-minded thinking is to be encouraged, but on the other, students could waste an awful lot of time figuring out the lesson, or worse, fail the unit. I unwittingly fell subject to this pitfall myself, managing to complete an entire undergraduate course online with an incorrect understanding of a particular statistical concept. I discovered my error during a video conference with my fourth-year supervisor. Luckily it was not a critical concept for my course. I never knew I had misinterpreted the teaching, so I never knew to ask for clarification. To this day, I wonder if there were other things I misunderstood. I believe that this would have been less likely to occur had I been in a physical classroom with fellow students. Do not underestimate the value of those snippets of conversation before and after class where perspectives are shared and, in my case, concepts are clarified!

21.3.2 Synchronous Study

Synchronous study, including live-streaming lectures, chat rooms and real-time discussion forums, provide instant feedback and, as I discovered, can be vital for students checking their interpretations of their lessons. Live-streaming lectures can be just as beneficial as face-to-face lectures, if not more so, given your lecturer is not likely to be obscured by another student's head or be far away because you were forced to sit at the back of the auditorium. Likewise, your lecturer's sage advice can be delivered to you undisturbed via headphones. If asynchronous study is a monologue, then synchronous study is a dialogue. It's a chance to reinforce the reading material and ask questions. It enables students to engage real time, providing depth to the learning material by sparking discourse and debate. I need to receive information in several ways (e.g. reading an article, listening to my lecturer and watching a visual presentation) before I really grasp a theory. Having the opportunity to describe an idea, as I understand it, or listen to a fellow student grapple with a concept can solidify my learnings.

However, you can provide all the tools for a rich, synchronised online learning experience, but not all students will use them. On the continuum of engagement,

I experienced the two extremes and rarely the perfect middle ground (you know the one, that cohort of students that switch on their mics and webcams, log on to all lectures, share articles in the group documents, and regularly post topics on the discussion boards).

21.3.2.1 The Vacant Classroom

One online learning extreme is the vacant virtual classroom. A list of student names never to be seen beyond the welcome lecture. This is not just a problem for the online lecturer and Institution. On more than one occasion, I found myself the sole student logged on for the live lecture, which doesn't always make for a great discussion. Given the competing schedules of most online students, I guess this is bound to happen from time to time. Yet, there was always at least one student who appeared to be enrolled, but you never heard from them. They are the 'Claytons' student (to use an older, colloquial Australian phrase) or, in other words, the student who is not really a student. Heaven forbid you were assigned a group task with them. In one instance, after I expressed my concern to my lecturer, she disclosed that the student appeared to be completing the weekly modules but they had never attended a lecture or answered emails. What was I to do? What could she do? They ended up appearing suddenly three days before the project's due date without explanation.

Perhaps it's just a manner of different learning styles or personality types, and there will always be students who will engage less than others. Some students loathe studying and just want the perfunctory certification to quickly move ahead with their career, while others enjoy a richer learning experience. I speculate that online study attracts more introverted personalities, and as a result, students who are less likely to overtly engage.

The online lectures that had me logging on early were the ones that created that fear of missing out, or FOMO. A lively recap of the takeaway lessons from last week's online lecture, or thanking a student for their insightful comments made during the live discussion makes me wonder what I missed out on. Likewise, participating in the live chat that is going on in the corner box while you teach makes it feel like a real classroom—engage with the students, and they are more likely to engage with you.

21.3.2.2 Chat Rooms and Social Media

The other online learning extreme is not necessarily too much, but perhaps just inappropriate, engagement. I'm talking about unmoderated chat rooms and social media pages. This is when students establish a private, online 'study group' on a social media platform, such as Facebook or Messenger, away from the eyes of the lecturer or educational facility. Now the fact they appeared in literally every unit I studied suggests that many students get enormous benefit from them. However, I

cannot say that I ever did and after joining one or two, I quickly discovered they were not for me for two fairly significant reasons.

The first reason why inappropriate student engagement can be a problem is that I found they at best served as a distraction to my studies and at worst undermined my confidence. Often students will post their assessment marks, but of course, only those who did well. So if you happened to not do as well as others, it could give you the illusion that you are somehow failing. I remember in one chat room there was a student boasting they received a high distinction only to discover later when chatting to the lecturer about my own mark that the highest marks awarded were distinctions. So to my fellow pupils beware the boastful student, ignore the marks of others and speak to your lecturer if you are concerned about yours.

The second reason why inappropriate student engagement is a problem is far more serious—the risk of collusion. What may have been an innocent post clarifying the assignment question can suddenly look like collusion if a person responds with their answer for it. It's interesting because those snippets of conversation before and after on-campus lectures I discussed earlier may also contain similar discussions, but somehow in writing it feels much more sinister. I had invested too much time and money to risk being thrown out of a course, so when I saw these blurry lines, I left the group and never joined another. I believe these groups are susceptible to collusion. Just because a bunch of students are doing it one way does not mean they are right. Find the answer for yourself—it makes that high distinction much more rewarding.

21.3.2.3 Discussion Forums

Online discussion forums are, in theory, great ways to generate debate and feel connected with fellow students—if they participate. I need to be honest here and admit to never posting on a discussion forum. Being time-poor, I focused on the activities that gave me marks or added learning value. I never experienced a discussion forum that worked as a forum for discussion. They were either not used at all, or used to ask questions about assignments. My experience is similar with moderated chat rooms—students quickly left for the unmoderated ones! However, a friend of mine, also studying online, was mandated to write one post and one response to a post to pass each module. She said she loathed it at the time, but in hindsight learnt quite a bit from other students posting their insights. She described how it helped her to feel less isolated, encouraged group cohesion, helped her to stay on track and introduced her to new resources and interesting links to further information. I now regret not trying to encourage this sort of exchange of thoughts in my studies; I think it would have brought out my passion for the subject matter! So my advice to students is to go ahead, engage in forums (the moderated ones), particularly if you find yourself among a lively cohort.

21.4 Support

Student support is vital for all modes of study. I have not visited a tertiary campus yet that is not wallpapered with posters offering support for all manner of challenges. Support is possibly even more important for the online student given their increased likelihood of social isolation, competing demands, or perhaps disability, all of which may impact on academic performance. In the absence of poster boards, the online student typically has scrolling advertisements for support services in their browser side bars, emails introducing them to services and usually an orientation module which provides information and contact numbers.

However, Monash University went one step further—they had Steve. Steve was my personal support person who was there to help me with any question I had. Steve would check in periodically to see how I was doing. When I mentioned I was nervous about returning to study after a long break he gave me a list of study resources and where I could find them online. When I had trouble enrolling in a unit due to a technical glitch, he fixed it for me. When my little boy was sick and needed me right as the assignment was due, he listened patiently as I sobbed out of exhaustion and guilt and then we talked through some options. I loved Steve. Later on, I had Katrina, and she too became a life raft on many occasion. I just cannot emphasise enough how valuable this personal support was for me. I know that some universities are trialling artificial intelligence systems to help ease the demand on staff to provide student support. I have yet to experience this myself and so will reserve judgement, but if part of the challenge of online learning is overcoming isolation, then I am not sure if I would feel as connected to Siri or Alexa as I did with Steve and Katrina.

Finally, other little things are important too. Like 'office hours'—a time when your lecturer is logged into the virtual classroom and available to chat with you, privately if you wish. Even if I did not have a particular question, I tried to attend the office hour as other students might ask a question I never thought of. It offers another point of connection and the chance to develop a rapport with your lecturer.

21.5 Recommendations and Reflections

Off-campus learning has come a long way and a rich, robust learning experience equal to, if not better than, traditional on-campus learning is now possible with online study. The main challenges of online learning are ensuring students have access to a range of learning materials, encouraging students to be active participants in their learning, and overcoming the problems associated with learning in isolation. These challenges are not necessarily unique to online learning, but the increasing popularity of this study mode has perhaps put a spotlight on the need for more innovative, web-based solutions to make online study more organised, engaging and supported—and this requires all parties to put in some effort.

The educational institution must invest in an excellent online platform and a strong student support system. The lecturer should upload materials well before we need them, use the classroom chatbox and office hours to engage with students, and strive to create that fear of missing out. For the student, invest in good technology, plan ahead and engage. Turn on the webcam, share an interesting article, and respond to someone else's post. Likewise, attend the office hours and send an email to your lecturer introducing yourself. Call student support. I promise you will have a better learning experience if you do.

Commencing my Masters in Clinical Psychology on-campus, it is clear that not all courses are yet able to transition to the online format. However, I would not hesitate for even a minute to study online again. I believe all courses could benefit from having some sort of online component, for the more ways information can be taught to me, the greater my understanding. If for no other reason, at least I don't have to get out of my pyjamas….

Penelope Lovegrove is a graduate of the fully online Graduate Diploma of Psychology Advanced course at Monash University, Melbourne, Australia.

Chapter 22
Online Education in the Time of COVID—a Political Science Student's Perspective

Ciera Hammond

Abstract The abrupt transition of institutions to distance learning in response to the COVID-19 pandemic in 2020 has challenged both teaching staff and students, especially in theory-heavy fields such as Political Science, where it can be difficult for students to grasp complex concepts without having face-to-face interaction with faculty. COVID-19 has elucidated a plethora of equity gaps that were already present in higher education, such as caused by some students not having access to the Internet or an electronic device at home. This chapter presents a student's eye view of online education, particularly in its accelerated expansion in response to COVID.

22.1 Introduction

The rapid transition to distance learning due to the COVID-19 pandemic was a sudden change that left many university teaching staff and students feeling overwhelmed and unprepared. As a graduating senior, I was devastated to find out that my university was making the transition to distance learning for the final quarter of my undergraduate degree. As a student of a theory-heavy course—political science—I was curious to see how this transition to online education would affect my grades, as well as my ability to learn and be productive.

22.2 Online Learning Challenges and Opportunities

Online education is relatively new, and as a result is still evolving. There are many challenges that can inhibit or enhance student success. First and foremost, I live in a relatively rural area, so the Internet connection is not very strong. This made connecting to Zoom meetings relatively difficult, as I would keep losing access and have to re-join in the middle of the meeting. Furthermore, teaching staff

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who are not experienced in using online education tools such as the Blackboard Learning Management System and the Zoom teleconferencing system can make online learning unnecessarily stressful. For example, one of the classes that I took last quarter was a basketball class. I was very disappointed that I would be unable to play in person but was excited to see how the teacher adapted what I believed would be a fun course. He emailed us the syllabus during week two of the quarter, and it outlined five assignments from which our grade would be based. However, there were no due dates, prompts, or guidelines. He was nearly impossible to reach via email, and the next time we heard from him was during finals week.

Another drawback to distance learning is that some teaching staff assigned significantly more work than usual to students in order to compensate for not being able to meet in person. I was fortunate enough to only have one teacher who did so, but peers of mine who had multiple teachers assign more work than normal had to dedicate nearly twice the amount of time to their education than they did when classes were in person. This only added to the stress that everyone was feeling and did not lead to a better understanding of the material.

As an online student, I found that synchronous classes and teaching staff setting aside designated hours for students to ask questions facilitated a more successful online learning environment, as students had a designated time to ask any questions that arose from the readings and assignments. Furthermore, synchronous online education components help keep online students motivated, particularly when they are isolated as this allows them to interact with individuals outside of their home. Additionally, university administrators need to do their part to ensure that all students have access to the online resources that they need to be successful online learners.

While there are many drawbacks to online education, there are also benefits. I am someone who is very involved on campus, and often felt overwhelmed running from meetings to class to work while on campus. One of the benefits of distance learning is that all but one of my classes were asynchronous, meaning that I could complete the assignments in my own time. This made my schedule feel much less hectic, as I had time in between obligations that I did not have when classes were in person. However, there are still individual challenges that students must overcome when learning in an online environment.

22.3 Online Political Science Learning Challenges and Opportunities

Political science is a subject rooted in analyzing and writing. Often times, especially in subfields such as political theory which examine the work of various philosophers and their impact on forms of government, the texts use archaic language which makes the material more difficult to digest. As a result, the majority of class time is typically spent trying to discern the main ideas of the text and how they are applicable to modern society. I took one of these courses, Classical Political Thought, this past

quarter and it was very difficult to learn during Zoom lectures. The unique element of distance learning is that the student has to be autonomous and invested in their education. They must be willing to set aside extra time to essentially teach themselves materials, since teaching staff may not be available after a lecture or during office hours. While this is fine in courses that are relatively simple, it creates a significant problem in classes such as advanced mathematics or philosophy, in which the student cannot read the book and fully understand the material by themselves. This is one of many potential drawbacks to distance learning.

22.4 Online Education in the Time of COVID Challenges and Opportunities

A personal challenge that I had to overcome in my online learning was staying motivated during the COVID pandemic. The year 2020, thus far has been packed with challenging international events, such as the USA almost going to war with Iran, the fires in Australia, and then the global COVID pandemic; it has been anxiety-inducing to say that the least. Couple that stress with trying to adjust to working from home, in an environment packed with distractions, and it can be extremely difficult to stay motivated. Furthermore, the inability to go to the gym, see friends, etc., contributed to this lack of motivation. I am someone who thrives on human interaction, and the ability to see my classmates and teaching staff throughout the week, as well as other students in the library, inspired me to be productive. Additionally, I am most productive in social environments such as coffee shops. That was impossible in the wake of COVID-19, and I found myself lacking a productive workspace and the motivation to stay on top of my coursework.

While many people believed that distance learning is the same as online education prior to COVID-19, I did not find this to be the case. I had taken online courses before, and there are many disparities between online education in a time of normalcy and online education in the time of COVID-19. The most notable difference that I found is that teaching staff who teach online regularly are familiar with programs such as Zoom and Blackboard. Furthermore, their syllabi tend to be structured with clear expectations for the term. I found that some professors are not at all familiar with these programs, and therefore the course in and of itself was difficult due to a lack of structure and organization. For example, some teaching staff were unable to effectively lead lectures because they did not know how to use Zoom properly or would send out their course syllabus with no due dates or criteria for evaluation. This was particularly frustrating as a student, because the majority of class time was spent trying to figure out how to use certain platforms rather than discussing the course materials. However, these are issues that can be easily resolved with time and resources investment from university administration and faculty.

22.5 Reflections and Recommendations

Universities that have announced that their next semesters will be taught online can take steps to ensure online student success. Back in March 2020, when the switch to distance learning was made, faculty only had days to prepare for the transition. However, faculties now have a much longer time to prepare to teach online, therefore, there should be no issues with online teaching staff using platforms such as Blackboard and Zoom. Another component of distance learning that should be reassessed is the workload given to students who are participating in online education. These can be stressful, and assigning an excessive amount of assignments to students to compensate for courses being taught online is not conducive to achieving a productive and enjoyable learning environment.

There are many steps that the university administration and faculty members can take to ensure student success in the distance learning environment. First and foremost, clear expectations are essential. Syllabi that outline criteria for evaluation and deadlines for assignments will prevent unnecessary stress for students. Additionally, teaching staff should designate a couple of hours a week to being accessible for students via Zoom. While responding to student emails is helpful, there truly is no substitute for a verbal explanation of a concept in which a student can ask questions as they arise. Lastly, the university administration must ensure that students have access to all of the resources that they need to be successful, such as Internet and an appropriate electronic device, in order to ensure that the already present equity gap in higher education does not worsen. All in all, while distance learning is not always ideal in the time of COVID there are many steps that can be taken to ensure that students are still learning well.

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Chapter 23
New Frontiers: The 'E-Academic' in Higher Education

Lisa M. Burke

Abstract A decade ago, tertiary academics who combined traditional campus-based and online deliveries were described as 'early adopters' (McShane, 2004). With considerable growth in the new frontier of online teaching, these early adopters have embraced changing roles and competencies to now engage only in online delivery. Whilst a sizeable body of research has detailed the learning styles, needs and successes of online students, a comparable paucity of research details the experiences of online academics. Via research, practice reflections and personal accounts, this chapter illuminates the life of the 'e-academic' who specialises in the online development and delivery of educational materials. Predictors of strong performance, role satisfaction and wellbeing in e-academia are examined in considering what makes a good online academic. First-hand accounts of the e-academic will be offered that illuminate the e-academic as an author, designer, navigator, motivator, catalyst, technician and advocate. In addition to looking inwards at e-academics, this chapter looks outwards to consider where online academics fit in traditional tertiary settings. The portrayal of e-academics as "outcasts on the inside" (Costa, 2015) will be considered in examining juxtapositions between online and traditional roles. With research suggesting academics feel ill-equipped to perform online roles, practice-based tips will be offered to support successful transitions between traditional and online education.

23.1 Introduction

Consider the traditional academic: A learned person, a respected expert in their field. A person who manages quality teaching, research and community endeavours. A person who balances responsibility to students, institution, profession and community. All within a building at an institute of higher education.

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Now consider the new academic—the e-academic: A learned person, a respected expert in the field. A person who manages quality teaching, research and community endeavours. A person who balances responsibility to students, institution, profession and community. All via electronic means at an institute of higher education.

Fifteen years ago, academics who combined traditional campus-based and online deliveries were labelled 'early adopters' (McShane, 2004). With considerable growth in the new frontier of online teaching, some of these early adopters have embraced changing roles and competencies to now engage solely in online delivery. This chapter enlivens the experiences of a campus-based academic turned e-academic. Via research, practice reflections and personal reflections, this chapter illuminates the life of the teaching-focused e-academic.

23.2 The E-Academic as an Educator

Be it campus-based or electronic, the role of an academic as an educator remains the same—to impart knowledge, facilitate learning and promote student application of contextual knowledge. However, significant differences lie between campus-based and e-academics in the primacy of technology.

Digital natives are comfortable with and attracted to working with technology (Stockham & Lind, 2018). For digital immigrants, including this author, e-academia represents a new frontier. Working in my first role as a traditional campus-based academic in the 1990s,one's greatest technology fear was a blown overhead projector globe that would prevent sharing of neatly hand-written overhead transparencies to a lecture theatre of hundreds of students. Now we have all been required to upskill and present educational materials with technological expertise.

Being an e-academic requires a high degree of technological skill such as hypertext markup language, teaching platforms, and software and hardware troubleshooting. The primacy of technology for e-academics means that delivering a single unit within a degree or diploma involves:

- Electronic presentation of course materials typically via a learning management system (LMS) such as Moodle.
- Development of student activities to promote electronic engagement and completion.
- Engagement and support of enrolled students via electronic means, such as discussion boards.
- Publication of online library reading lists to facilitate student learning.
- Creation of office-hours, akin to open-door physical office spaces where students are welcome to engage with academics.
- Engagement and support of staff via electronic means, such as discussion boards, electronic instructor guides and shared drives of electronic class resources.
- Presentation of classes via stable teaching software such as Blackboard Collaborate.

- Management of online staff meetings in software via organisational software such as Zoom.
- Development and delivery of electronic-friendly assignments.
- Facilitation of staff marking processes via electronic platforms.
- Development of student examinations to be completed online under examination conditions, and invigilation of student examinations.
- Gathering of quality assurance data with regards to teaching and unit materials.

Although invariably engaging with technology to prepare and deliver a unit, excessive engagement with technology troubleshooting adds workload pressure and detracts attention from the e-academic's primary role of education. To successfully prepare and deliver a unit, the e-academic's role must be supported via technology support services for both staff and students. This may take the form of an assistant whose role focuses on student support or the institution's technology support department.

It remains that some academics report feeling uncomfortable with technology and report lacking the educational design skills needed to develop electronic resources (Conole & McAndrew, 2010; Longman & Green, 2011). Those academics transitioning from campus-based models to e-academia require support to transition and develop technological skills that complement their existing educational skills (Briggs, 2005). Rather than daunting, the e-academic can feel excited by the opportunities presented by this. Transformation of a hands-on tutorial or laboratory activity from traditional to online campus is not a limitation (Considine, Nafalski, & Nedic, 2017). A healthy dose of creativity required in e-academia, with autonomy and innovation marked features of the role. Technology also offers greater opportunity for more specific metrics on student engagement. Software records elements of student participation and engagement, thus presenting strong opportunities for ongoing improvement and student feedback (Fenley, 2010).

Having fulfilled both campus-based and e-academic roles, I have observed no difference in student attendance though I have observed a difference in student engagement in synchronous activities such as classes. As highlighted by Bender (2012), the virtual classroom is characterised by students who enter the room early, students who enter the room punctually, and students who enter the room late for various technological, time-zone or personal reasons. Staggered entrances have a negative impact on class flow, learning opportunities and conduct of group activities. Like campus-based classes, there is also the tendency for largest student numbers to appear in the first few weeks, trailing off as the teaching period continues. In a campus-based lecture theatre, there will be students with pens eagerly poised in the front row and there will be students poised to sleep in the back row. For e-academics, this takes the form of students with videos and microphones actively on as well as students who choose to be present but not activate their videos and/or microphones thus remaining anonymous. Despite various initiatives to encourage students to attend classes with active video and audio including making this compulsory as part of student enrolment, a proportion of students elect not to activate video in particular. This remains a challenge for online courses to address, with research

linking regular attendance and engagement to better student outcomes (Crede, Roch, & Kieszczynka, 2010; Sharma, Mendez, & O'Byrne, 2005; Zepke & Leach, 2010).

Thus, to ensure student success in study and positive staff workplace experiences, the e-academic is required to have strong skills in engagement and motivation. Additional to one's skills is one's opportunities. The lack of opportunity for e-academics to engage in course- or career-based hallway conversation with students as one moves about the campus is noted. The e-academic does not have the opportunity to encounter a student whilst ordering morning coffee, thus limiting the student's casual opportunities to seek guidance and the e-academic's casual opportunities to provide guidance. Hence, it is recommended that analogous cyber-coffee opportunities be presented for e-academics to engage with students.

Similarly, it is important to provide staff formal and informal opportunities for collegial engagement to thus promote staff well-being, identity and pride. So as the literal water cooler serves as a central point for academics to gather and share information, e-academics benefit from a metaphorical water cooler to provide opportunity for unsolicited discourse.

23.3 The E-Academic as an Administrator

Along with the delivery of online education representing new frontiers, the administration of online courses represents new frontiers. Developing and managing an online tertiary course requires significant investments of time, capital and resources. One model potentially relevant to e-academia is public–private partnerships (PPPs). Employed widely in transport, energy, telecommunications, water, sewerage and healthcare services, PPPs involve formal cooperation between the private sector and local governments to develop infrastructure and services. This model of cooperation between sectors can be extended to education, particularly for infrastructure or vocational education (Gideon & Unterhalter, 2017; Pillay, Watters, & Hoff, 2013; Vertakova & Plotnikov, 2014). Cooperative partnerships allow each agency to achieve complementary yet independent goals whilst sharing and saving resources. Cooperative partnership appears particularly suitable for e-academia, with universities able to partner with invested parties to develop and manage not just individual online courses, but to develop and manage fully immersive online campuses for staff and students.

A beneficial enterprise would see one aligned sector developing and maintaining the administrative elements of an online course such as enrolments, pastoral care or graduation, with the academic sector focusing solely on managing the academic elements of that online course. This premise alone is appealing for academics whose passion is education rather than administration. A further benefit of sector partnerships in unstable political climates is more stable funding arrangements. However, partnerships present challenges including increased numbers at the policy and stakeholder table. Principles of effectiveness, efficiency, sustainability, equity and beneficiaries are more complex in partnerships (Pillay et al., 2013), with criticism that for-profit private university arrangements represent an attack to traditional universities as centres of learning (Chibber, 2010).

23.4 The E-Academic as a Faculty Member

E-academia presents the best of both worlds for professional and personal identity. Whilst maintaining professional identity as a faculty member of an esteemed institution, the e-academic also has the freedom of working away from the campus. E-academics typically work from home, with some electing to work in a library or hot-desking in community co-working spaces. Some e-academics find the role convenient as they balance family life, hobbies or travel with work, with the only e-academic requirements being time and a reliable Internet connection (Chiew, Hwa, & Teh, 2018).

In addition to looking inwards towards the experience of being an e-academic, it is important to look outwards to consider the fit between e-academics and traditional campus faculties. One area of faculty difference is staffing profiles between e-academic and campus-based departments. Despite holding doctorates and profiles as established experts in their fields, e-academics performing coordination roles have typically been employed as Level A ('Assistant Lecturer') academics. This is contrasted with the typical profile of campus-based academic where a Level A academic is new to the field and/or without a doctorate. Promotion opportunities for e-academics can be more limited due to the greater challenge in meeting promotion criteria that more amenably represents campus-based academic work. There has been concern that the quality of research produced by e-academics is not as reputable, with e-courses being characterised a source of revenue rather than a legitimate academic endeavour and thus relegating e-academia to the role of 'little sister' of the academic family. Costa (2015) describes an apparent clash between the freedom associated with technology and conservative academic values, resulting in e-academics being 'outcasts on the inside' (p. 194). Until this discrepancy is resolved, it will remain a challenge for online departments to recruit and retain staff.

23.5 Reflections and Recommendations

In addition to being a learned expert and a person who manages quality teaching, research and community endeavours, the e-academic is also an author, educational designer, technician, navigator, motivator, entrepreneur, catalyst and advocate. Whilst a sizable body of research has detailed the experiences of campus-based academics, a paucity of research details experiences of e-academics. Research is needed to elucidate predictors of performance, role satisfaction, and well-being in e-academia, culminating in an enhanced understanding of what makes a good e-academic.

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Chapter 24
Lies, Damn Lies and Logistics: Teaching and Studying Research and Statistics Online

Darold C. Simms

Abstract What word in any academic setting generates more instant horror than *statistics*? Its appalling terms include autocorrelation, heterocedasticity and multicollinearity, which are coupled with horrifying formulas. It does not have to be so horrible! This chapter presents approaches used in hundreds of online classes that are equally applicable to nursing, education, research design, psychology, business administration and many other courses—especially statistics courses. This chapter introduces the *construct of *landmarks, along with their importance and applications. Everything in this chapter is aimed at teaching and learning statistics online quickly and smoothly while avoiding time-consuming gridlocks. The chapter doesn't present abstract statistics teaching and learning theories or fantasies, but only approaches which have been (sometimes painfully!) battle-tested.

24.1 Overview

> Everyone has a plan until he gets hit in the mouth
> Mike Tyson.

24.2 Guidelines and Approaches

Whenever hearing that technology, however, defined, would revolutionize education, this very experienced online instructor snickered. Former Secondary teachers (especially those of us in our 70s) watched many "miracle" programs come and go. In *Educational Computers: Largely Ineffectual and Likely To Remain So* (Simms, 1988), the author observed that effective online teaching and learning tools must (not

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should) make work easier and save time. Imagine moving a giant pile of dirt using a shovel as opposed to bare hands.

This chapter introduces *Landmarks—teaching tools that are crucial for (but not limited to) teaching online. These are defined *as items, procedures and competencies that once mastered turn students into skilled researchers and exacting evaluators* and will always be preceded by an *asterisk. These *Landmarks open doorways into universes that go beyond simple memorization and are aimed at getting classes—online and otherwise—underway quickly and smoothly. Students learning via the online methods presented here are expected to master and apply these competencies regardless of their backgrounds, cultures and learning styles—no matter where they start from all students need to end up with the same skills.

Teaching online is extremely time-intensive. Creating presentations, providing grading feedback, especially on written tasks, keeping classes moving forward and avoiding other deadly online time sins need to be addressed quickly and effectively. It is difficult to avoid spiralling into time-consuming modes of answering the same questions—over and over. Online education, however, is extolled as an effective and economical means of dealing with large groups of students. However, what happens before and after the effective and economical online class presentations? Consider, for example, the time that online instructors spend hunched over their computers before and after their classes, their online frustrations, and their end of course lynchings/student satisfaction surveys. Maybe Mike Tyson was right about online teaching and learning—especially of statistics!

24.3 Some Important *Landmarks

24.3.1. *The *Reality Principle** landmark states that *Statistics are the servants of research and NOT the other way around*. Commonly heard among research design/statistics instructors at education conferences is "I specialize only in qualitative (or solely quantitative) research." This is WRONG! Students who leave their statistics classes bereft of quantitative skills will fall prey to expensive consultants and become graduates who are totally clueless as to what transpired in their research theses and dissertations. In short, they took (and paid for) our classes without fully benefiting from them, which is academic theft.

Students do written presentations and expect them to be graded and returned in a timely manner and doing this online is especially time-intensive. Have we really progressed beyond the good old red-pen days? No matter how powerful our computers are, grading is tedious and slow.

24.3.2 The clear expression *landmark states that students' writings meet the highest standards. Simms provides specifics:

"…Because formal written presentations will be arriving, some considerations merit our attention. Part of what is expected of students is the ability to express themselves clearly and according to academic conventions…" These are easily stated:

(1) Demonstrated competence in writing for academic groups.
(2) Ability to incorporate scientific methodologies.
(3) Expertise in presenting technical information in manners that those without technical backgrounds will easily understand. This is called the "*Plain Language rule."

This *Landmark guarantees that errors like the following will be dealt with savagely:

…and this passage was sighted (SIC) by Howell (1979).

The town was placed under marital (sic) law.

Integrating technology compliments (sic) educational reform practices and procedures.

Students should immediately identify the following as fatally flawed:

…this blue item correlates with that green item…

…this study used a t test…

…Results were nearly significant…

Statistics texts are crammed with horrifying formulas. Although powerful computational tools including SPSS®, Minitab®, CSS Statistica® and others are readily available, and they are awkward, tedious, aggravating to learn and require time-consuming computer labs. This statistics instructor earlier incorporated Casio Fx® calculators into his Research Design/Statistics classes. These were cheap, readily available and following short, simple tutorials easily provided basic statistical outcomes. In time, this instructor's classes transitioned from the Casio® calculators to Microsoft Excel®. Prior to beginning a class, students would receive a tutorial (Simms & Saeedy, 2014), teaching them how to plug data into Excel and obtaining summary statistics.

24.3.3. *Defining the terms correctly *landmark is particularly important. Students are taught the following steps.

1. Define the term.
2. Provide additional information to help the reader or hearer understand.
3. Provide examples from YOUR reality to bring the points home. You violate the process if you do not follow this step precisely.

Repeat steps 2 and 3 as needed. For our illustration, we will use the term **Range*.

1. **Range* is defined as the distance from the *highest score to a *lowest score in a group.
2. You can calculate the range simply by finding which are the highest and lowest scores.
3. In my class I gave a 100 point quiz. 30 students took it. The highest score was 100 and the lowest score was 34. My *range, therefore, is 100–34 or 66.
4. Stated another way, the *range went from the lowest score (34) to the highest score (100).

Some key statistical terms and principles and their correct definitions are.

*__Bias.__

*Bias is anything that can cause incorrect information. *Whether the error made was intentional or not has no bearing.* *Data are either *valid or *biased; there exists no middle ground.

*__The "Where You at?" Principle__

Before planning where you are going it is imperative that you first know where you are.

__*Fatal Errors__

Often researchers create presentations with flawed elements then expect praise for what they did well. Not so. If *bias is introduced, the entire process has been invalidated.

*__The Ugly Question.__

This is a first step in acquiring *valid information although be forewarned that raising it could make you unpopular.

"*The Ugly Question:" why should I believe ANY of this information?

__*The Iron Law__

The Iron Law: If you cannot explain your research to anyone who asks, you have wasted everybody's time.

__*The Reality Triangle__

A valuable tool in detecting research statistical or any other *bias is to subject it to what is called the reality triangle.

*__Truth.__

Fact_____Reality

*Unbiased *data must always meet ALL criteria to be valid. Here is an example:

The bumblebee's body is deemed too heavy for its wings to raise it off the ground. This has been proved by careful measurements. We can, therefore, regard the measurements as fact. Since we have no real reason to doubt that the measurements were made correctly, we can consider them as being truthful. Thus, we have satisfied 2 of the 3 legs of the triangle. The reality apex provides some reason for consternation. As Benny Hill observed, "Bumble bees can't fly; however, THEY don't know this."

24.4 *Landmark Scenarios

Often *Scenarios stimulate immediate brainstorming and discussions while also having important future implications. Consider the following:

**Take This Job and Shove It?*

Two golfers go to a driving range and hit 100 balls each. One of the golfers is the world's number 1 golfer and the other golfer tends to put those in the immediate area

at risk. They use the same clubs, and, for the purposes of this (invented) scenario, they hit all 100 balls perfectly straight.

After the 100 balls are hit, both golfers have averaged exactly the same distances and this situation continues for a number of weeks. The weakened golfer is elated because his performance equalled that of the pro and knowing that his next stop is the PGA Tour, he begins listing all of the creative places he plans to tell his boss to stick to his job. Is he demonstrating sound judgment?

**Is Perfection Here?*

La Verne University, located not far from this instructor's home in Southern California, in 1997 took out large ads in area newspapers trumpeting, "100% of the La Verne Law School Graduates Pass The Bar Examination on the First Try." The ads then extolled the low student to professor ratio, the brilliance of its faculty and other reasons for law students' performances.

What do you think?

24.5 Reflections

A Foolish General Discusses Tactics; a Wise General Addresses Logistics
General George Patton.

To his delight, this instructor received an invitation to join an online education pioneering university, which helped keep him off deadly Southern California (USA) freeways. After teaching many hundreds of classes he learned his most important online teaching lesson that it is vital to maintain momentum. Online faculty forums routinely contain accounts from instructors whose classes crashed and burned. Many of these accounts noted that there were 10,000+ comments in 5-week classes. This is deadly online teaching sin on several levels: One constitutes the amounts of instructors' time hunched over computers, another one constitutes the resulting frustrations suffered by all involved, and, of course, the resulting end of course surveys more closely resembled lynchings than constructive feedback. Another deadly online education sin is that if a class takes twice as long as it should have to teach its instructor could have taught two classes in that time.

An important online education virtue is that the less feedback that is required of the online instructor, the smoother things will run. Does this sound simple? It isn't. This instructor enjoyed times when classes turned out to be online education Nirvana. If a student raised a question or indicated hitting a snag, another student immediately posted a note like "…Hey, Cheryl, Doc walked you through that process. See presentation 3 bold heading 3.7…" The usual response would be, "Got it" to my never-ending delight.

So what did this instructor learn from his online teaching experiences? Predominately that although there were many rough spots, the *Landmarks approach is a winner. One daunting aspect of it is that it demands mastery, and not students

simply being able to regurgitate information to achieve high test scores. Successful online teaching requires initiating and sustaining *momentum*. Otherwise, frustrations quickly arise with predictable, painful and time-consuming results—for learners and teachers. Sadly, our best hope is minimizing not eliminating online pain because nobody is immune. As each instructor has his/her own approaches, seeing how others modify and adapt the *Learning Landmarks approach to their own situations would provide fascinating insights.

To summarize this chapter, optimal online education, including statistics education, is about time—the less time that's required to teach and learn, the better.

This instructor sought to train future researchers to be sufficiently comfortable with the subject to create rigorous, *valid and *reliable research that will withstand the most harsh scrutiny. Unfortunately, even when things are going smoothly, breakdowns still occur. It's part of the nature of the online education beast. Nobody is immune.

This instructor does not consider his online teaching approaches to constitute the last online teaching word. Instead of repeating much already presented information, he would ask an instructor beginning his/her first online classes some questions:

1. What do you plan to do?
2. How do you plan to go about it?
3. Why did you choose this particular approach?
4. What "Worst-case Scenarios" have you prepared for?

Top sales managers point out that you cannot push a chain. Successful online teaching consists of pulling students forward. This takes careful planning and doing. In addition, some tasks are extremely time-consuming and there's nothing you can do to improve them. For example, this instructor would post students' progress reports individually on Sundays. The following week's presentation would be posted the previous day. This overlap gave students time to respond to their progress reports while getting a jump start on the following week's tasks. A process that worked well was posting prior presentations into a folder titled *Presentations.* Many students would run hard copies for times their computers were not available. Another necessary, successful approach was having a *Worst-Case Scenario in place. This came into play when systems went down or worse. The simplest recommendation was to instruct students to telephone their instructor. This resulted in his receiving calls from all over the world. He recalls one especially.

(Phone rings).

Student: Hi, Doc, this is Leticia.

Instructor: Hi, Leticia, whazzup?

Student: I have a question on the two-way ANOVA.

Instructor: What's that noise?

Student: Oh, that? That's the tornado siren. We're (Tulsa, Oklahoma USA) on tornado watch.

Instructor: Uh, Leticia, GET OFF THE PHONE!

This online instructor was honoured to be invited to contribute to this TOTAL text. He would caution that what he has presented here does not lend itself to those wanting to simply "pick and choose", online education needs a TOTAL approach.

24.6 Recommendations

Proceed cautiously, intelligently and wisely.

This instructor, although retired from the online (and on ground) battlefields, welcomes communications from online and other colleagues. To request further information, he may be reached at the following:

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Anyone interested in Dr Simms's other writings and presentations need only submit requests. They are firmly in the public domain although he requests appropriate academic honesty processes are respected.

Appendix A

Some (Definitely Not All) Landmarks.

As you run down this list, each of the items should make perfect sense. If something does not, then you have some work to do reviewing them.

- 2 Golfers
- 3 Travellers
- Baselines
- Levels of Measurement
- La Verne University scenario
- Simpson's Paradox
- Nonparametric Statistics
- Parametric Statistics
- Bias
- Ethics in research
- Baseline Transformations
- The Normal Distribution
- Grading on the curve
- Terms
- 10-Step process
- Statistic

- Parameter
- Test selection processes
- F test (variances)
- Independent t test
- Paired t test
- T test (parameter)
- T test (correlation)
- P values
- Plain English
- Fatal errors in research.

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Chapter 25
The Mindful Massive Open Online Course (MOOC)—Mindfulness at Scale

Craig Hassed and Richard Chambers

Abstract The *Mindfulness for Wellbeing and Peak Performance* massive online open course (MOOC) was developed at Monash University and is hosted on the FutureLearn platform. Mindfulness programs are generally taught within the intimate, face-to-face interaction between students and teachers so there are challenges in translating them to the online medium where there is a lack of direct and immediate interaction between learner and teacher. We attempted to deal with these challenges in a number of ways. For example, having an expert and motivated development team, anticipating and pre-empting possible learners' concerns and challenges, cultivating a safe and respectful learning environment, using discussion forums skilfully mentored every day by experienced mindfulness trainers, helping learners to move at their own pace, and bringing learners and teachers together through the production of weekly feedback videos. That these challenges have been successfully met is borne out by the popularity of the course and the feedback from learners. We have gathered extensive data demonstrating that the course significantly increases mindfulness and work or study engagement, and reduces stress as measured with validated rating scales. It has been heartening to observe how transformative *Mindfulness for Wellbeing and Peak Performance* has been, but also been surprising to observe how well a discipline such as mindfulness can translate into an online learning model. This chapter will describe the principles, development and implementation of this successful online course.

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25.1 Introduction

Any educational intervention, whether it be face-to-face or online, is aimed at one or more of the following four objectives; fostering behaviours, changing attitudes, cultivating skills or increasing knowledge. Perhaps these days a fifth objective is increasingly important—being interesting and/or entertaining. Each of these objectives presents different and particular challenges to online educators where the content, delivery, teacher–student interaction, and the pastoral care of the student are influenced both positively and negatively by the online medium. If done well, these challenges can be turned to advantages, but if done poorly they become significant barriers.

25.2 Background

25.2.1 What Is Mindfulness?

The term 'mindfulness' has been used to cover a very wide range of meanings and applications. It can be seen as a form of meditation as well as a way of living, a method of self-development, a cognitive practice, and/or a form of therapy. Although relaxation is a common side effect of being more mindful and present, mindfulness is not primarily a relaxation exercise. In its most general sense, mindfulness is associated with training *attention* (i.e. attention regulation, focus, present-moment awareness, self-awareness) and *attitude* (i.e. non-judgmental, open, curious, self-compassionate, accepting, equanimous).

The capacity to be mindful is perhaps our most important executive function because other executive functions such as working memory, fluid intelligence, self-awareness and emotional regulation are so dependent on it. Attention and present-moment awareness are like a prerequisite for other executive functions. Mindfulness can be developed both by the formal practice of mindfulness meditation as well as the informal practice of being mindful in daily life.

There has been an explosion of interest and research in mindfulness and its applications in recent years. For example, in 1998 there were five new papers on mindfulness published in peer-reviewed journals listed on PubMed, but there were 1,500 new papers published in 2019. Part of the reason for this phenomenal growth is that mindfulness, being a generic skill, has a very wide range of applications including improving mental health, stress management, emotional regulation, physical health, education outcomes (learning and teaching), communication, relationships, decision-making, work performance, prosocial behaviours, and reducing errors and accidents. Each of these individual areas of research and application is expanding at the same time leading to this exponential growth overall.

The explosion of interest in mindfulness from research and practical perspectives is being driven by many factors. These include the accelerating pace and stress associated with modern life, growing rates of mental health problems such as depression and anxiety, and the increasing levels of distraction associated with the overuse and misuse of technology. In many ways, mindfulness can be seen as a remedy for modern life.

25.2.2 Mindfulness in Education

The uptake of mindfulness within schools and universities has been rapidly increasing and there are many different formulations of mindfulness-based interventions delivered within educational settings.

The most widely known and respected forms of mindfulness programs are mindfulness-based stress reduction (MBSR) developed in the late 1970s by Jon Kabat-Zinn, mindfulness-based cognitive therapy (MBCT) developed by a team of psychologists with the aim of preventing the relapse of depression and acceptance and commitment therapy (ACT), considered a "third wave" cognitive behavioural therapy. MBCT was based on MBSR principles but adapted more explicitly as a form of psychotherapy. These two group-delivered programs run for 8 weekly 2 1/2 hour sessions with a one-day retreat. They prescribe up to 40 min of formal daily mindfulness meditation and mindful yoga, as well as strategies to reduce stress and depressogenic thinking, and be more mindful in daily life. Although MBSR and MBCT are the two gold-standard mindfulness programs they do not necessarily fit neatly within school or university curricula in terms of curriculum time available, level of commitment and motivation from students, level of training for teachers, and contextualisation within the curriculum. Therefore, other formulations of mindfulness programs expecting lesser levels of time commitment and practice, and specific adaptations to contextualise mindfulness to the needs and expectations of the students, are often required.

The main objectives of such adapted interventions are most commonly coping better with academic stress and enhancing mental health, improving learning and academic performance and self-development. The popularisation of mindfulness, however, has meant that the uptake has been widespread but somewhat inconsistent in terms of quality of instruction and extent of the training.

When delivered well, evidence from meta-analyses has so far suggested that mindfulness can significantly improve student mindfulness, mental health, resilience, academic performance, social competence, prosocial behaviours and emotional regulation (Klingbeil et al., 2017; Zenner, Herrnleben-Kurz, & Walach, 2014). Some studies, however, have demonstrated poorer outcomes. For example, one study showed that a school-based mindfulness program had a negligible effect, although the intervention was delivered by an external trainer and was poorly integrated and reinforced within the school by the teachers (Johnson, Burke, Brinkman, & Wade, 2017). This highlights one of the primary challenges of scaling mindfulness—the

fact that increased uptake sometimes leads to inconsistencies in quality of instruction and extent and type of training.

25.2.3 Mindfulness at Monash University

Monash University, based in Melbourne, is Australia's largest university with approximately 75,000 students across a number of Australian and international campuses. The history of mindfulness at Monash began with one of the authors (CH) taking up a teaching position in the Faculty of Medicine at Monash in 1989. With an already established interest in meditation and mind–body medicine, CH provided optional sessions for the medical students in 1990. Then, in order to respond to a faculty survey which found high levels of student stress, a two-hour meditation-based stress management workshop was included in first year medicine as core curriculum in 1991. Further 12-week meditation and mind–body electives were provided for interested students.

Most mindfulness programs implemented at tertiary level are optional or elective. Very few are implemented as core curriculum. The medical student mindfulness program was significantly expanded in 2002 to be a fully integrated six-week mindfulness-based healthy lifestyle course, with extensive training in mindfulness and examinable content (Hassed, Sierpina, & Kreitzer, 2008; Hassed, De Lisle, Sullivan, & Pier, 2009). Research on our medical students at Monash showed that mindfulness, when effectively integrated into the core curriculum, was readily received and led to improved mental health, study engagement, self-care behaviours and quality of life even during high-stress periods of the semester like exam time (Hassed et al., 2009; Slonim, Kienhuis, Di Benedetto, & Reece, 2015; Bailey, Opie, Hassed, & Chambers, 2019).

As the interest in mindfulness started to grow and the benefits of the Monash medical student program became more widely known in the early 2000s, invitations arose for CH to provide staff programs, train-the-trainer courses, and presentations more widely around Monash University. These were given significant support by heads of the counselling services, campus community division (CCD), occupational health and safety (OHS), human resources (HR) and Monash residential services (MRS). Soon other faculties gave invitations to provide within-curricula mindfulness-based wellbeing courses or seminars for their students. Later, the other author (RC) developed an elective, extra-curricular student program, mindfulness for academic success (MAS), a 6-week course that explicitly coached students in applying mindfulness to reducing stress, improving focus, managing digital technology and overcoming procrastination.

With increasing concerns about the negative impact on wellbeing and mental health of increasing workloads and expectations upon academic and administrative staff at Monash, in 2010 a meeting was organised between the Vice-Chancellor, CH and other key stakeholders in the Monash community. A Mental Health at Monash working party was subsequently formed to advise regarding policy and strategy to

promote staff and student wellbeing across the university. In 2011, a two-days per week mindfulness coordinator position was created (CH) and in 2012 a two-days per week mindfulness consultant position was also created (RC).

The level of interest and uptake of mindfulness has continued to grow enormously at Monash University with the aim of integrating mindfulness as widely as possible across the organisation. There are currently 20 curriculum-based mindfulness programs integrated into diverse degree courses including nearly all the health disciplines, IT, business, education, and architecture and design. In each case, it is contextualised and delivered in slightly different ways depending on student needs, resources and available curriculum time.

In 2014, the Vice-Provost of Education became interested in developing online courses as a way of scaling the mindfulness offerings throughout Monash. From this meeting arose two main projects; first, a mindfulness-based massive online open course (MOOC) through Monash's fledgling collaboration with FutureLearn; secondly, the blended (online and face-to-face) delivery of a mindfulness program to improve learning and teaching. Following the meeting, resources and a skilled and motivated team based in the Monash University Office of Learning and Teaching (MUOLT) were provided. From this emerged the *Mindfulness for Wellbeing and Peak Performance* (MWPP) online course which in 2015 was voted one of the top 10 MOOCs worldwide (Class Central, 2015) and later as one of the top 20 best online courses of all time (Class Central, 2020) https://www.classcentral.com/collection/top-free-online-courses. It has run three times a year since then and also led to the subsequent development of another MOOC, *Maintaining a Mindful Life* (MML), which also made the Class Central Top 20 list.

The rest of this chapter will explore the key lessons and insights learned from developing and delivering a successful online course.

25.3 Challenges of Teaching Mindfulness in an Online Format

25.3.1 Online Versus Face-to-Face Delivery

Teaching mindfulness online represents a significant deviation from accepted or traditional practice and provides a range of challenges which need to be identified and, as best as one may, overcome. Some of these challenges are particular to mindfulness but others are common in delivering online teaching in other disciplines as well. These include possible dilution of teaching compared to face-to-face programs, a lack of clarity around the appropriate length of programs and maintaining good-quality engagement over time.

Mindfulness has historically been most commonly taught in face-to-face, small group settings. The intimacy and immediacy of the teacher–learner interactions are held by many to be vital for mindfulness training for a number of reasons. First, the

teacher teaches mindfulness as much by example and modelling as they do by what they say. Second, learners often have personal difficulties in mastering what appears at first glance to be a very easy skill. These difficulties require the opportunity to relate concerns and put questions to the teacher with a view to support, encouragement and reassurance. Third, learning mindfulness is like following a path with many subtle nuances and obstructed with many misconceptions and assumptions. The easiest and best way to help a learner to stay on the right path generally requires in-depth discourse and questions. Fourth, in a group there is strength in numbers with the opportunity to hear from other group members and learn from their experience and questions. Furthermore, the potential for isolation is minimised by being in a group as each learner discovers that their difficulties are not personal but are in fact shared by the great majority of other people.

With the advent of the Internet, the possibility has emerged to deliver mindfulness programs online. This provides a number of benefits such as reaching more people around the world (including people who would normally not be exposed to mindfulness), allowing people to learn in their own time and at their own pace, and making mindfulness accessible to people who would not normally be attracted to learning in groups.

However, there is a legitimate concern over whether an online course can provide an adequate level of support for distressed learners in particular. A significant proportion of people interested in learning about mindfulness may be doing so because they are wishing to find ways of coping with significant physical health problems, or stress or mental health issues such as anxiety and depression. In a face-to-face learning format, there is the opportunity to identify such issues, discuss them as they arise and to provide targeted pastoral care for the learner when they need it. This is a much harder thing to do in an online format where there may be thousands of learners learning at the same time. Learners who are struggling may not wish to post their questions and concerns in such a public and un-confidential forum. If they do, they may self-declare more than is appropriate. They may leave themselves open to bullying or well-meaning but misdirected advice from other learners. Furthermore, with thousands of comments being posted on an online discussion forum the learners' questions or concerns may simply be lost under a deluge of other posts.

There is also debate and differing views over how long a mindfulness course should be. For example, MBSR and MBCT are both eight-week courses and even abbreviated formulations of mindfulness-based programs tend to be at least six weeks in duration. Some would view this as just a convention but others would say that this is because learning mindfulness is not just a matter of taking in information which could be delivered in a short, concentrated workshop or course. Learning mindfulness is a life-skill and process that requires time to master. The learner may be working against a lifetime of habit. It often takes a week or two for a learner to get into any sort of regular mindfulness practice. Then the first discoveries over the next couple of weeks tend to be realising how distractible the mind is, which is often a frustrating and disheartening stage. If the learner stays with the practice, then they may begin to experience some of the benefits that come with being more mindful such as being

more present, focused and on-task, worrying less, and being less reactive, resistant and judgmental even to the things they find uncomfortable.

The research is unclear regarding whether courses need to be six or 8 weeks in duration, or whether shorter courses can be equally effective. A 2009 review found no relationship between amount of in-class training and changes on multiple outcome variables, although the authors conceded that perhaps some outcome variables may require more in-class training than others (Carmody & Baer, 2009). At Monash, our programs have historically been 6 weeks in duration (generally 6 one-hour weekly sessions) and the first few runs of the MWPP were likewise six weeks. However, as the number of online courses at Monash increased, we developed and tested a 4-week version of the program, with the additional two weeks of content included in the MML course. This allowed us to test whether a four-week version of the program was long enough for the fundamental mindfulness skills to be learned and consolidated. Qualitative feedback from learners suggested that they had indeed grasped these skills to the same apparent level that they had during the six-week version of the program. A currently unpublished evaluation of the program found significant pre-post improvements in trait mindfulness (using the Frieberg Mindfulness Inventory), perceived stress (Perceived Stress Scale) and work or study engagement (Utrecht Work Engagement Scale). The results will be discussed later, but a question remains, however, whether this shorter format allows these skills to be consolidated in a way that will be sustained over time. This is an unknown in the delivery of both face-to-face and online mindfulness training and is a priority of future research.

25.3.2 Fostering Learner Engagement

A second major challenge in online delivery is maintaining learner engagement over time. This is true of any training that unfolds over a number of weeks but is especially an issue with online training. Statistics on online learning show that less than 20% of people actually complete online courses they sign up for (Ho et al., 2014) and this is probably even lower when the course is free, as are the Monash courses housed on the FutureLearn platform. There is a complex psychology to maintaining engagement in online courses over time and we consider ourselves to be at the very beginning of understanding it. However, there are a number of features of MWPP—and indeed all of our online courses—that we have found to significantly increase engagement. We keep videos relatively short, with an average of around five minutes and a maximum of approximately ten. This accommodates short attention spans and also gives the course a more dynamic (less lecture-like) feel. Some of the videos are talking heads but we increasingly made the videos less formal and used interactive discussions between the two lead educators. We also combine a number of elements including video, text (articles and summaries), MP3 meditation practices, quizzes and links to additional resources such as relevant TED talks. However, the two features of our courses that seem to make the biggest contribution to learner engagement are the inclusion of moderated forums (discussion boards) and weekly feedback videos.

Each step (component) of the course has a forum where learners are encouraged to comment on their experience of the exercise/material, ask questions and respond to each other's posts. Guidelines around appropriate posting are provided throughout the courses and learners are reminded of complying to FutureLearn's code of conduct (FutureLearn, 2020). Discussion points are given to focus conversation, and trained mentors monitor each forum on a daily basis, answering questions, providing feedback and encouragement and keeping conversations on track. We have had surprisingly few inappropriate comments given the usual trends observed in online forums (see the comments section on YouTube, if you don't know what we are referring to!). The immediacy, quality and personalised nature of the feedback helps to bring the mentors, educators and learners together. It breaks down isolation, creates a sense of community, and, although the MWPP course is not designed to be therapeutic, it also helps us to fulfil an obligation we have to provide pastoral care, support and guidance to potentially vulnerable learners. This latter point is something we were very conscious of, as the online medium does not allow the personal interaction afforded in face-to-face courses. We wanted to ensure, in as much as we are able, that people needing more intensive or personalised care than we could provide were encouraged to access it.

At the end of each week, the mentors provide a brief summary of the major discussion topics from the week, and we then film a brief (i.e. around 10 min) feedback video where we provide feedback and respond to particular learner challenges and questions. These are informal, off the cuff responses and, apart from providing guidance and encouragement, really help the learner to know that there is a team on the other side of the screen who is listening and interested in what they have to say.

Together, the forums and the feedback videos appear to be a major strength of our online courses, providing a sense of immediacy and engagement with learners that sets them apart from courses that just provide videos and other passively consumed content. These features have now been integrated into all online courses offered at Monash. Despite these successes, we recognise that there is a lot to yet discover about the psychology of keeping people engaged in online courses.

25.3.3 Practice is More Important Than Theory

Another challenge with online learning is getting learners to engage in an experiential way with the content rather than just engaging with it intellectually and rushing through it. It is a little like the difference between giving a lecture on hydration (informative, perhaps interesting but it makes no difference) versus drinking the water (transformative and sustaining). To use the old metaphor, the information, background and evidence is important for getting the horse to the water, but how do we help learners to drink it? The online space potentially encourages superficial engagement—with hyperlinks, auto play features and the sheer amount of content available. In our courses, we expressly encourage learners to take their time with each of the topics and exercises, highlighting the value of practising and applying

what they learn in their lives, rather than just perusing content and then moving on to the next step. A small proportion of learners disregard this advice and rush through the entire four-week course in a couple of days, but the majority take their time and report noticeable benefits from doing this. Ideally, we would like to "unlock" each of the weeks one by one, although the FutureLearn platform currently doesn't allow this.

The practice of mindfulness skills was enhanced by the provision of guided meditation practices in the form of free downloadable MP3s. There were also a series of other mindfulness-based 'experiments' such as noticing the negative impact of complex multitasking or the positive effect of mindful communication. Such practical and experiential exercises help learners discover for themselves the effect of the misuse of technology and the importance of being mindful.

25.3.4 It's Hard Not to be Distracted (Even When Studying Mindfulness)

Modern technology being what it is, the nature of the online space also conditions people to engage with content in a distracted way, often attempting to multitask and consume multiple forms of media simultaneously, for example, scrolling on a phone while watching TV, eating dinner and doing an online mindfulness course at the same time. Amusingly, many learners notice this very same habit when engaging with our online courses. Fortuitously, the mindfulness content and practices encourage learners to start noticing and changing these habits. During the exercises (we often call them 'experiments') on the presence of mind and multitasking, we routinely see learners' comments in the forums that they catch themselves being distracted *while watching the videos.* They often laugh at their own habits, and we reassure them that just noticing the impact of the modern technologically addicted world, and that noticing their own distraction is a sign of increased mindfulness. Many learners report becoming much more focused and less prone to distraction by the end of the courses, and are thankful for this.

25.3.5 Continual Improvement

The mode of delivery and use of learning management systems like FutureLearn is an area we are continually experimenting with and reflecting upon. While we have been pleasantly surprised by the popularity of our courses and the benefits our learners report from completing them, we are constantly reviewing feedback from both learners and moderators. We make ongoing revisions to content, structure and the way we language each component of our courses after each run. At times we have noticed learners' express confusion about certain topics, and at other times certain

exercises have engendered reactions and robust discussions on the forums. We take all of this into account and tweak the programs accordingly.

25.3.6 How to Contextualise Generic Skills for a Wide Audience

One of the other challenges we faced was how to contextualise mindfulness and to make the course relevant to a very diverse audience in terms of age, experience, vocation, motivation and needs. For example, we had students and academics, adolescents and retirees, practitioners and patients, novices and experts, time-poor professionals and full-time parents and carers, employed and unemployed, and the well along with people with physical and mental health issues. They are all wanting to do the same course and expecting different things from it. Some wanted more of the evidence and scientific rationale, others less. Some were interested in how mindfulness might help them deal with daily stresses, others wanted to enrich their lives. Some wanted it for personal and others for professional development.

We, therefore, had to strike a balance in terms of depth and specificity of content, keeping it relevant to such a diverse group of learners. The educators and mentors were responding to specific insights, questions and challenges from individual learners but also conscious of panning back, with other learners in mind, and reflecting on the implications of those insights in other walks of life. For example, a parent might share their individual experience of being unmindful with their child, but we pan back and consider what this same distractedness might also mean in the classroom or boardroom. The individual experience is always a vehicle for drawing out more universal lessons and principles.

Considering that many of our learners came from academic backgrounds, some wanted more depth and evidence whereas other learners were simply interested in the practical side of mindfulness. To meet these differing needs, we would often briefly refer to studies during the weekly video content and feedback videos and then provide links to the relevant studies or content for those who wanted to take a deeper dive into the content. If this balance between providing too much or too little scientific support and evidence was not well struck we soon heard about it and would address it.

Many learners also wanted to test their knowledge for which reason quizzes were provided each week and a brief exam was also provided for those who wanted to pursue a certificate of satisfactory completion of the course.

25.4 Developing and Running the Course

Developing and running free online courses requires both a philanthropic disposition and a judicious approach to the use of resources, time and personnel. Monash University was prepared to invest money and technology into developing free online courses for a few reasons. First, it helps to fly the flag, as it were, by getting the university's name in front of many people and presenting its areas of expertise to a wide audience. Second, it is an investment in developing capacity and experience in producing online courses. Third, it is a method of testing the market or appetite for online offerings.

The time investment can be considerable but can also be minimised, for example, by not over-planning the course. Another way to blow out time and workload is to tightly script the development and delivery of video and audio offerings. If one trusts the expertise of the educators then there should be generally less need for a precise script and extensive rehearsal time. This also means that delivery is less formal making it more approachable for learners.

The last piece of the equation is the importance of teamwork and having good personnel behind the camera. The lead educators develop the content and course structure, but having experienced hands with the requisite project management, media and IT skills is vital. This not only shares the workload but also ensures a quality product is delivered on time and on budget. We had a great team at Monash who worked extremely well together. The process was not only productive but also creative and enjoyable. Each member of the team's input was valued and their expertise indispensable.

Since its inception, the MWPP course has reached a wide audience on the FutureLearn platform but we have also found that with relatively little work it is possible to repurpose the course for use as a part of curriculum for under and post-graduate courses at Monash. In these cases, we generally deliver an introductory face-to-face interactive lecture/workshop before students then go and do the online course over the following few weeks. Between times they have their own moderated discussion forums and weekly feedback videos. We then finish the course with a follow-up face-to-face session for final questions and discussion. We have found this model very useful for introducing mindfulness training to scale and in already packed curricula where resources and time for face-to-face instruction may be limited.

25.5 Outcomes and Evaluation

25.5.1 Who Does the Course?

At the time of writing, we have had over 360,000 people enrol in MWPP (and a further 58,000 in MML). The majority of participants are from the UK (40%) and Australia (19%), with the majority of the remainder mainly coming from Northern

America, New Zealand and Western Europe. In 2019, we began offering Spanish-language versions of both courses, which worked well, so we expect to see more Spanish-speaking people enrol in future.

In terms of age, 18% of participants are over 65 years of age, and the majority (57%) are aged 46+. Our statistics indicate that no participants are younger than 18. About 40% of participants found out about the course through the FutureLearn website or newsletter, and around a third had the course recommended to them by a friend.

When we examined motivation for doing the course, most participants enrolled to enhance their wellbeing (referred to as 'flourishers') and help them better manage personal and health issues ("fixers").

25.5.2 Starters/Completers/Repeaters

Of the participants in MWPP, around half become 'active' learners. These learners engage with the various exercises and information provided and contribute actively to forum discussions. We see around 20% of active learners actually go on to complete the course (which we define as completing 90% or more of the course steps.

In any given run of the course, over 90% of participants are new (i.e. haven't completed the course before). About 7% have done the course once before and just over 1% are doing it for the third time. We have a small percentage of participants who do the course each time it runs, perhaps reflecting the value they receive from it, as well as the way mindfulness skills need to be practised repeatedly over time (rather than just 'ticking them off'). Interestingly, our forums sometimes make it seem like the majority of participants are repeaters, as this cohort tends to be more vocal and active in the discussions.

25.5.3 Outcomes

In 2015/2016 we evaluated the first two iterations of MWPP. At the time it was offered as a six-week course (it was later split into two 4-week courses, MWPP and MML). We had a massive response to this study, with around 17,000 participants providing complete pre-course data and 4681 participants also completing post-course evaluations. In the end, we were able to link pre/post data for 2105 participants.

We assessed trait mindfulness using the Freiburg Mindfulness Inventory (FMI) (Walach, Buchheld, Buttenmüller, Kleinknecht, & Schmidt, 2006) perceived stress using the Perceived Stress Scale (PSS) (Cohen, Kamarck, & Mermelstein, 1983) and work engagement using the Utrecht Work Engagement Scale (UWES) (Schaufeli, Salanova, González-Romá, & Bakker, 2002). We found significant improvement on all three measures, suggesting that participating in the online MWPP led to greater mindfulness, reduced stress and improved work engagement. The UWES

contains three subscales, assessing vigour, dedication and absorption. Participants reported significant increases on all three subscales. This research is currently under preparation for publishing in peer-reviewed journals.

25.5.4 Qualitative Feedback

Feedback from learners has been almost universally positive which is very encouraging. As a testament to that has been the fact that the course has been rated by Class Central as one of the most popular in the world since its inception. To give a sense of the learner experience we will let the learners speak in their own words with some of the following quotes.

First is the significant effort we go to in order to span the potential chasm between learners and educators due to the online medium. The flow from discussion forum to feedback video kept the loop flowing and personal.

"Excellent feedback video - thank you; and so lovely to see that Craig and Richard are so engaged with the course as to be actually following our engagement and discussions - not something I have noticed with all the previous courses I have done. I also appreciate the academic level of the course…".

"Without doubt the best MOOC I have taken. If you are receptive to the ideas and sound academic principles, this course could change your life. It is supportive, inclusive and led by two brilliant educators supported by mentors. Weekly feedback on YouTube responds to learners questions and comments as they have arisen that week. Cannot recommend highly enough."

As previously discussed, the balance of theory, practice and application to daily life was delicate but well negotiated.

"This was an amazing course. The theory to explain the science behind mindfulness was accessible and interesting and the practical tasks consolidated the learning and showed students how to apply this to our lives. I feel so empowered by what I learned from this course. Wonderful to have two charismatic leading academics who are also practitioners lead the course. The feedback videos at the end of the week were very useful, addressing any questions learners had. Can't say enough good things about this MOOC. It was extraordinary. Thank you to all involved."

The differing motivations for people doing the course were evident, but those, for example, who were interested in the more spiritual and philosophical side of mindfulness were also interested to see the science, and those who were more scientifically minded were happy to explore the deeper aspects of mindfulness once the scientific aspects had been covered to their satisfaction.

"This course is an excellent introduction to mindfulness. It has scientific evidence to back it up and although I approached it from a more spiritual side I really welcomed the scientific approach and I think this would suit a lot of people. I feel able to continue to practice mindfulness on my own but would definitely do this course again when it runs as a refresher."

The sense of being a valued member of a community of learners was deeply valued by many. In keeping with the spirit of mindfulness, the conversations from the forums were commonly full of compassion and support for others who were struggling although we discouraged learners from taking on the role of being educators or therapists even if they were experienced practitioners.

"Excellent tutor, resources and I felt part of the learning community through discussion and comments online. I can't praise this course enough. I suffer from depression and anxiety and the course is helping me manage these better too."

"I'm surprising myself by managing to be mindful more often every day! I feel it will become a habit. I like the gentle, sincere way Craig and Richard deliver and they cover the various aspects in a way that is easy to understand. Thanks also to the comments from the rest of the team, it keeps this very interactive course alive and fresh."

One phenomenon we have noticed is that learners commonly wish to dive into the course multiple times both to deepen their learning and also to remain part of a vibrant learning community.

"I have taken this course 6 times, and have registered to participate again. It is life changing and one of the best MOOCS I have studied. The course can be studied at different levels, with a wealth of additional material available. The two charismatic educators have pitched the course at the right level. They provide excellent meditations available for download. They also provide weekly feedback sessions. The mentors are extremely active in their support for learners. Finally the learners themselves provide a community of support for each other."

Perhaps this last comment sums up why the educators and all the team behind this online course value and enjoy putting in the effort to provide it. It really relates to the uplift we receive by seeing how much people value doing it.

"This course is brilliant. The team are inspirational and introduce the mindfulness way of thinking and living in a user friendly way. They are a wonderful advert for Monash University, for Future Learn and for Mindfulness!."

25.6 Reflections and Recommendations

Overall, we have really enjoyed running MWPP and MML. We were pleasantly surprised to hear feedback from participants suggesting they had made at times powerful insights and significant shifts in their behaviours. Initially, we thought that any online offering would be a distant second to face-to-face programs, but the anecdotal and quantitative evidence clearly suggests otherwise. It is personally very heart-warming to receive messages of gratitude from the participants, and to read their thoughtful comments on the forums each week.

Regarding designing and delivering a MOOC, we have learned a lot about what makes for a successful online course. There are a number of elements that seem to lead to good learner engagement and the outcomes we have observed. The use of short videos to deliver content seems appropriate in a world that increasingly relies on

this medium to consume information. The inclusion of moderated discussion forums after each video and exercise creates a 'live' feel to the course that appears to deepen learner engagement and maintain this over time. We routinely receive feedback that this is one of the most loved features of the course, and appears to foster creation of an online learning community among participants. In fact, participants commonly inquire about ways to stay connected after each run of the course concludes. These forums also help us see which content and exercises participants find challenging, allowing us to continually tweak the course to ensure it meets their needs and is presented in a way that makes sense to them. Finally, use of feedback videos is another feature of the course that sets it apart from courses that simply deliver content. These videos, summarising key challenges and insights that arise each week in the forums, further contribute to the live feel of the course and keeps participants both engaged on the forums (perhaps in the hope that their specific comment will feature in a video) and on track.

All of this said, we acknowledge that we are always learning. As we look to expand what we offer, we closely examine the qualitative user experience feedback from participants, as well as our own experiences delivering the courses, to ensure that what we offer creates the most value for participants. We hope that the success of our two existing mindfulness programs is the beginning of a new direction in education at Monash, delivering quality content to ever greater numbers of people around the world.

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Chapter 26
A Combined Students' and Teachers' Online Education Perspective—You May Ask Yourself: Some Key Questions to Consider Before Beginning an Online Course or Program

Jennifer Margaret Keller and Amy Collins Montalbano

Abstract The COVID-19 pandemic has sped up a process that had already begun: an increase in online teaching at all levels. While face-to-face courses will resume at some point, online learning is not only here to stay, but is perhaps the future face of many facets of education. This chapter offers both a student's and teacher's point of view—as the authors are both students in an online doctoral program and professors in higher education. The chapter offers a series of questions designed to assist students and teachers as they develop strategies and prepare to move online.

26.1 Introduction

Prior to March 2020, online education was already a juggernaut picking up constant steam. However, the global pandemic that began in the first half of 2020 thrust online learning spaces into the forefront of educational discussion and practice. At all levels of education, both teachers and students scrambled to adjust to the online and remote environments suddenly required by their districts and schools. Even once students and teachers re-enter physical classroom spaces, elements of online learning that had not previously hit the mainstream will likely be here to stay. It is within this context that this chapter addresses online students' perspectives—written for both students and teachers and including both academic and non-academic support advice.

But first, some background on the co-authors. For the past two and a half years we have been full-time students in an online education doctoral program in the United States. This program is fully online and admits students as members of a cohort, who then take all of their coursework together. We are also practitioners (Jennifer Keller as a journalism professor and chair of her department and Amy Collins Montalbano as a mathematics professor), who have experience on the flip side as well, as online

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instructors. So we offer a unique perspective as people who both learn and teach in an online space.

26.2 As a Student

Aspiring online students no doubt have questions prior to starting courses. These questions likely centre around what is obvious such as the experience (*What will it be like? How much time will it take?*) or outcomes (*Will I be successful?*), but there are other helpful queries that may not be as obvious to a novice online student. Below we recommend a few questions students should ask themselves if considering an online format, and we offer our own reflections based off of nearly three years spent as students in a fully online program.

26.2.1 What Is Your Purpose?

There are good reasons, and not-so-good reasons, to take a class or program online. One good reason is if your work schedule is unpredictable or you work during the time most classes meet face-to-face. Another is if your ideal program is out of state but moving isn't an option or if you are a parent who needs a flexible schedule. But if your decision is based on an assumption it will be easier, watered down, or take less time than a face-to-face class, these are poor reasons.

I (Amy) joined an online program because I work full time as a college professor and needed flexibility, and none of the face-to-face programs in my geographical area appealed to me. Jennifer also works full time in a college town where the closest face-to-face program is a two-hour drive away. Academically, the program has been every bit as challenging as the face-to-face version of the same program but with the added hurdles of fewer social supports and a greater time commitment. Listening to a lecture and participating in face-to-face group discussions while attending a traditional class will not take as much time as consuming the information for yourself and participating with classmates through discussion boards. Written information takes longer to read and write than verbal ideas take to hear and articulate. Taking a class online may save commuting time, but the course content itself is likely to be more, not less, time consuming.

26.2.2 How Many Highlighters Do You Own?

One of our online cohort members previously worked as a student advisor, and any time an incoming freshman asked him whether or not they should take an online class, he responded by asking them, "How many highlighters do you own?" It was a funny

and clever way of asking them about their organisation skills. When I (Amy) start a new semester, I have separately coloured folders, spirals, and yes even highlighters, for each of my classes. Especially for students taking multiple classes simultaneously, organisation is crucial. Otherwise, it is easy to lose oneself in a mess of work and due dates.

But organisation of materials is not enough. Online students must also be capable of creating their own work structure when taking an online class. At the very least, face-to-face students have dedicated days every week they attend class—often this rolls into dedicated study times on campus as well. While flexibility is often a primary reason students seek an online environment, flexibility should not mean lack of structure. Instead, flexibility should mean that the consistent days and time dedicated to the course are determined by a student and their schedule. Without required attendance in a physical classroom space, it is too easy for online coursework to suffer from the "out of sight, out of mind" effect. Set up a regular time of day (or at least a set amount of time each day) to dedicate to your online class. This dedicated time should be scheduled well enough in advance of deadlines to avoid last-minute efforts. Procrastination is perhaps the online student's worst enemy, because possibilities abound for things to go wrong—the system might be down, you lose power at your house, your computer has decided just at the wrong moment to update and reboot itself….the list goes on.

Related to structure is getting into a rhythm. Regardless of how your online class is organised—by week, module, major assignment, etc.—you should be able to find some sort of pattern and flow to the course. For example, for modules that open on Sunday and close on Saturday night, you might find that you get your reading(s) done on Sunday and Monday, initial discussion post by Wednesday, replies by Thursday, and analysis paper on Friday and Saturday. At the start of a new week, begin the cycle over again. At the beginning of a new term it often takes a couple of weeks to find the flow of the course, but once the rhythm and daily tasks sink in, it frees up a lot of mental space that is otherwise spent fretting over deadlines and when to do what.

26.2.3 Are You Willing to Seek Helpful Resources?

It may not be initially apparent, but online courses can offer an abundance of helpful resources: an orientation module, the syllabus, FAQ page, technical support, librarians, discussion boards, other classmates, faculty office hours, email and plenty others. But students must be willing to search for and use them. Borrowing from John Donne, 'no man is an island'. And while students may be physically isolated from others when taking an online course, that doesn't mean there aren't plenty of ways to connect and seek assistance. Reaching out to classmates, attending your faculty member's office hours (or asking for an appointment), or sending an email to a librarian are just a few ways to avoid suffering or struggling in silence.

Although, as noted in Lovegrove's chapter, there can be inappropriate student engagement or collusion when using online chat rooms, they can also be an important resource. Our cohort uses a group chat, which is an excellent venue to ask questions related to deadlines, occasionally vent, and offer support to one another when preparing for something important and stressful (such as dissertation proposal defenses). In addition, we occasionally have separate chats for asynchronous classes—not to share specific information but to help stay organised and on track to avoid last-minute procrastination. It can be a helpful way to encourage each other and stay accountable in the absence of physical classmates.

26.2.4 Have You Assessed and Planned for How to Deal with Distractions?

Distractions are a constant challenge in our stressful society, but online students tend to complete most (if not all) of their coursework on the kinds of devices that are most full of distractions. It is helpful for students to ask themselves—when you are on your computer (or tablet or smartphone), how do you tend to waste time? This will likely be the greatest source of temptation (e.g. to click out of that book chapter or discussion board to send off an email or "just check Reddit real quick"). I (Amy) often rely on the Pomodoro technique, during which I spend twenty-five focused and distraction-free minutes on task followed by a five-minute break. And I typically use that break by taking a quick walk, not checking email or Facebook or Instagram, because that is how five minutes becomes two hours.

Also consider your environment. Face-to-face students spend dedicated time on campus, away from family, roommates, and the kitchen that needs cleaning. But if you are working on your class from home, it will not be long before others in your space start asking for time. If you live with someone, whether it's family or friend(s), have a conversation with them beforehand about the time you will need to commit to successfully complete your class(es) and make sure everyone is on board.

A final consideration for those planning to take multiple online courses simultaneously—make sure they do not distract from each other. Or, put another way, try to plan your schedule so that your online classes complement one another. For example, balance a reading- and writing-intensive course with another class that is more project based. Also, the importance of organisation and structure we mentioned earlier increases when taking multiple online classes. If you have a couple of hours a day to dedicate to your coursework, rather than spending one hour each day on two different classes, dedicate that entire two-hour chunk of time on one class today, the other class tomorrow. You'll likely find this a more effective way to manage your brain power rather than wasting time swapping between classes.

26.2.5 Finally, Are You Taking Care of Yourself?

If you are electing for online options, it is likely because other obligations are clamouring for your attention and time. This makes sense and is understandable. But we cannot overstate the importance of taking the time and space to take care of yourself. Eating healthfully, moving your body, and getting plenty of sleep are crucial to your being able to effectually manage your many commitments. A student might be able to coast a few weeks while ignoring diet, exercise, and bedtime, but the effects will catch up. And when this happens, brain fog and loss of motivation are not far behind. So set aside fifteen minutes to write up next week's meal plan, take a walk around your block, keep that therapy appointment, and turn off the TV or computer when it's getting late. Your physical, mental and emotional health will thank you.

26.3 As a Teacher

As a teacher, we can learn a lot from our own experiences and from listening to our students. We are constantly reexamining and revising courses based on what we learn each term. With that in mind, based on experiences as students in an online program and feedback from our own students, here are a few questions to ask yourself when preparing to teach an online course.

26.3.1 What Is the Purpose of the Course?

Just as with any class, we suggest as a teacher you consider why you are asking students to perform a certain task or turn in a specific assignment. As Penelope Lovegrove mentioned in her chapter, optional discussion boards are likely to be seen as busy work and subsequently ignored. However, in our own experience, discussion boards that have a real purpose (and a mark or grade attached) can be extremely beneficial. If you want students to participate, give them a reason to do so. In one of our doctoral program courses, the first discussion prompt each week was designed for us to ask questions about the reading. The professor then followed up with responses to our questions. In other classes, the goal was to provide a dialogue between students about themes or experiences. In both cases, the discussion boards allowed students to receive direct feedback from others (student or teacher) and also to develop a dialogue with each other, which helps establish the sense of community that can occur in a physical classroom. We felt as though we knew many of our fellow students simply by their tone when asking questions and providing feedback.

Another important outcome of identifying your purpose is that it can help guide decisions regarding course content and circumvent attempts to cram too many things into any one class. Teaching online is different, especially when it is asynchronous.

When teaching face-to-face an instructor might often include group work and other discussions into the class, perhaps with homework points attached, because you have students together for an hour or two (or three). However, in online spaces, it is best to only include assignments that will advance the course and help them see connections. As a student, there is nothing worse than being assigned what is seen as "busy work"—which is only there to give us something to do. This means it is extremely important when you are not meeting with students on a regular basis to give them assignments that build on each other and help them make those connections they would make in a classroom.

26.3.2 Who Created This Course?

This is another important question to consider. If you created the course as an instructor, that will help in knowing this sense of purpose. In this case, it is intuitive to know answers to questions like the one above. However, if someone else developed the course and you are now teaching it, you might not know those answers. This means you need to be careful when revising the course that you do not eliminate things that were developed for a reason—such as helping students make those connections or connecting different pieces in the logical flow of the course. It's not unusual to have courses created by one professor but then taught by others. The key, however, is for each professor to understand the primary outcomes of the course and the reasons behind decisions. Once those are understood, then a professor can revise to their own teaching style without sacrificing student learning. However, as students, we have had at least one course where a professor made changes and then subsequent course assignments made no sense. The professor was trying to be helpful in not overloading us, but we ended up not understanding certain assignments because we hadn't received all the pertinent information.

26.3.3 How Long Can You Pay Attention?

This may seem obvious, but it helps to think about your own attention span when you are considering what your own students can do. How likely are you to watch a video that is an hour long? Or even half an hour? In today's world of Twitter and Instagram, students are used to paying attention in much shorter spurts. This doesn't mean that we should shortchange them in content, but keep in mind the ways that people think, and how information can be 'chunked'. So if you are creating a video and you need to cover several things, break it into pieces. Shorter videos make it more likely both that students will watch it the first time and also that they'll revisit if they feel they missed important information. This also helps you as a teacher, because you don't need to sit in front of that computer for 60 min recording—and rerecording if you make a mistake. In addition, it means you are less likely to have questions about

something that you actually covered in the video. Another way to help with this is to provide PowerPoint slides or PDF bullet points of what you cover in the video. This way students can download it and refer back to it—thereby reinforcing what they hear and see.

26.3.4 Is the Answer in the Syllabus?

We've all been there as teachers. We get asked a question about something that could easily be answered if only the student had actually read the entire syllabus (or at least searched through it before asking). Online it can be even more challenging because students aren't in a classroom where you can point out that location of information and they can learn from other students' questions. Along with the syllabus, it can be helpful to post an FAQ page for students. Think about the questions you get most often—whether about grading, the schedule, specific assignment items, and include a general FAQ for those. You'll still end up responding 'It's in the FAQ', occasionally but it does help students to have a resource to turn to before reaching out to the professor. So it might help declutter your email inbox. Additionally, it is a much-appreciated boon of information for those students who seek it out on their own.

26.3.5 What Are the Deadlines—For My Students and Myself?

We expect students to turn in assignments on deadline. However, professors don't always seem to have their own schedule for getting those assignments graded in a timely manner. It is incredibly important in any class—but even more so online where they can't ask questions as easily—that students receive feedback quickly. This doesn't necessarily mean within 24 h, but it does mean before they might need it for another piece of the coursework. We had one class where the feedback took so long that we were unable to use the first assignment for a later one (which was the entire reason for the first piece). This meant we had to do later parts using hypothetical data provided by the professor that was unrelated to our own research, rather than being able to use something that would have been practical and advanced our research.

Also, with assignments such as discussion boards, if you want students to participate, think about deadlines during any typical week or module. Our best courses, ones we've tried to emulate in our own online teaching, included a discussion post early in the module and then required replies later in the module. This ensured that everyone had time to read other comments before posting their response, and also that there were posts to respond to. Again, as in the first point, this helps establish that connection between the students.

26.3.6 Finally, Am I Putting People First?

As teachers, we need to think about the well-being of our students (and ourselves) as well as their educational goals and aspirations. This means thinking back to goals for assignments and whether we are overloading students (and ourselves). It also means listening to our students and understanding the outside issues and pressures they are facing. This has always been important but may be even more so in our current environment. Naturally, this does not mean we should just let students do whatever they want whenever they want and give them all A grades. But it does mean considering outside circumstances and whether extensions might help a student complete the class successfully. As a student, I (Jennifer) never expect to have extensions granted and don't often ask for them (probably because I'm also a teacher who has seen her fair share of eye-rolling requests). But I have been pleasantly surprised when a professor has understood that outside circumstances led me to miss an assignment and allowed me to turn it in without me asking for the favour. It also helps if students understand that they can always ask—even if their wish isn't always granted.

26.4 Recommendations and Reflections

This recommendation is also a reflection. We suggest that students and teachers can use the questions we have posed and discussed to reflect on their own situations. One thing that is true for both of us as students and teachers is the importance of reflection and evaluation. It is built into our dissertation process and it is an important component of being an effective teacher. These questions are just a beginning. There may be others that you find are important to your own reflection. They can serve as a tool for improvement and success. This means not only considering these questions prior to beginning an online course or program but also reflecting on them throughout the course, particularly at the end. Once the course is complete use these to evaluate the experience. What was the purpose? Did I achieve it? If not, why not? And what can I do to improve next time? If so, could it be better? What worked best? Was I overwhelmed? Was I successful? The important piece is not to answer each question perfectly. There is no perfect answer. It is to use them to consider what worked and what can be improved upon for the future.

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Chapter 27
Research Supervision for Online Students—What Makes a Good Online Research Relationship?

Ruth Tatnell

Abstract Flexible work and study options are becoming increasingly common, and in line with this, the demand for online and distance education has risen considerably. While this has enabled many students to access previously unavailable education, flexible delivery options are subject to a number of unique challenges. Higher education course work has been offered in an online capacity for some time. However, many courses, such as honours/4th year, master's, and Ph.D. programmes, require an additional, often significant, supervised research component. Navigating how this can work effectively in an online environment is a relatively new area of inquiry. This chapter will identify factors contributing to effectual supervision relationships, discuss differences in on-campus and online research relationships and make recommendations for how to ensure online research students receive an experience equivalent to that of those who are able to study on-campus.

27.1 What Is the Supervision Relationship, and Why Is It Important?

The research supervision relationship is a unique teaching arrangement in that there is no single accepted 'gold standard' or consistent pedagogical approach. Often, research supervisors have no specific teaching training, relying instead on their research ability and experience to guide them. As a result, supervisors tend to develop their own supervisory practice 'on the job', often based on their own experiences of supervision as students, emulating these when positive, or avoiding repeating the mistakes of their own research supervisors (Guerin, Kerr & Green, 2015; Lee, 2008). Similarly, whereas most tertiary teaching activities involve one teacher and an often a large number of students, research supervision is more often than not a one-on-one, dyadic activity. The supervision relationship is dynamic, in that it requires flexibility and progression from both supervisor and student as it moves from a primarily

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teaching role in the beginning to a more collegial one by completion (Roberts & Seaman, 2017).

Supervision relationships can take a number of forms: traditional supervision (a one-on-one relationship between supervisor and student); group supervision (where two or more students work together with a supervisor); or a mixed/blended model (utilising components of the above, as well as the inclusion of technologies such as virtual classrooms, discussion boards etc.; McCallin & Nayar, 2012). Regardless of the form it takes, the supervision relationship provides much of the structure, support, guidance, mentoring and teaching that students receive, which inevitably impacts their learning, grades and perceptions of academia. This relationship relies considerably on the quality of communication and interpersonal connection between supervisor and student in a way that traditional teaching models do not. Lee (2008, p. 267) stated "we know that the supervisor can make or break a PhD student", so it is reasonable to assume that in a 4th year or honours programme, where students have far less developed research skills, the supervision relationship is even more important.

27.2 A 'Good' Supervision Relationship

Recent qualitative research by Roberts and Seaman (2017), examined what constituted good undergraduate research supervision, as well as threats to this in a sample of Australian undergraduate supervisors. They found that the most successful supervision relationships were characterised by supervisors giving clear and direct advice while supporting their students and helping them gain confidence in their own research abilities. In this model, the supervision relationship evolved over time from one of the students being dependent on the supervisor for advice and guidance to a more independent relationship where the student essentially became the leader of the project. A key finding was that regardless of the supervisor's expertise in the area, it was personality matching between students and supervisors that lead to a 'good' supervision relationship. This importance of the interpersonal connection suggests that the role of the supervisor is more than simply guiding and supporting the research ability of the student.

So then, which aspects of the relationship, the individuals involved, and the process by which the relationship develops, make it 'good'? In a qualitative study of supervisors nominated for an 'Excellence in supervision' award, Guerin et al. (2015), suggested that there were multiple ways to establish a good supervision relationship, identifying a number of interpersonal features that contributed to the success of the relationship and the student. Setting a clear structure for the relationship, with expectations of both the student and supervisor (e.g. attendance at group and individual meetings, timeframes for responding and feedback) was important from the start. Interestingly, the 'good' relationships described by the supervisors ranged from very personal to strictly professional, although at either end of this scale there was both flexibility and clear boundary setting. For those in which a very personal relationship

was described, taking a nurturing and sometimes counselling approach while maintaining professional boundaries around how much involvement they had in students' personal lives, was important. Those nearer the middle of the spectrum reported that the ability to adapt styles of teaching and communication according to students' strengths or needs, and providing interpersonal support, especially in linking students with each other, led to good relationships. At the strictly professional end, supervisors cited availability, open and free discussion and co-attendance at work-based social events (but not socialising outside of work) as being key aspects of a well-functioning supervision relationship. From this, we may conclude that setting clear expectations, building rapport, creating opportunities for connection and flexibility seem to be crucial elements of a successful supervision relationship.

As supervisory styles have been written about extensively (e.g. Brown & Atkins, 1988; Lee, 2008; Pearson & Brew, 2002), the purpose of this section has not been to give a thorough analysis of supervisory styles and relationships. Rather, the preceding paragraphs are presented to provide the context for discussing the challenges that emerge when attempting to develop positive and successful supervision relationships with students who study at distance. For these students, physical availability of the supervisor is more limited than it is for on-campus students, resulting in communications frequently lacking facial expression, body language and tone, and few opportunities for engagement with fellow students. Therefore, explorations of how best to develop effective and successful supervision relationships online or at distance are certainly warranted.

27.3 On-Campus Versus Online: The Key Challenges of Online Supervision

While on-campus students benefit from physical closeness to their supervisors and peers, online students miss out on incidental contact, which can be just as helpful, if not more so, than official supervision meetings. On-campus students are often able to engage in ad hoc informal conversations with supervisors by simply knocking on the supervisor's door with a question or seeing them casually around campus, whereas online students must await a reply to an email, or for a pre-arranged meeting to occur. When studying on-campus, research students often share workspaces, enabling a supportive, collegial relationship between students. In addition, regular lab group meetings aid in the development of peer mentoring relationships between students across different levels of study. Fostering these collegial and supportive relationships between online students, who may never physically meet, is considerably more challenging, and students tend to rely more heavily on their supervisor in the absence of peer relationships (Nasiri & Mafakheri, 2015).

Analysis of the challenges of online research supervision has highlighted that students completing their doctoral studies via distance report feeling isolated, unsupported, disconnected and alone (Erichsen, Bolliger & Halupa, 2014). Erichsen et al.

(2014) additionally found that distance doctoral students needed to be more self-motivated, disciplined and organised than their on-campus counterparts. Importantly, these students reported that a positive supervision relationship online, characterised by support and encouraging feedback, was the most salient aspect of a positive research experience. In their research on the attitudes and experiences of online supervisors and their students, Orellana, Darder, Perez and Salinas (2016), reported that, primarily, students wanted their supervisors to be accessible, friendly and to show empathy and direction; relatively fewer required expertise in the field. Conversely, the supervisors stated that they thought students wanted to support and expertise most. Highlighting this, the number one expectation students had of supervisors in this study was 'quality of relationships', whereas the number one belief supervisors had about student expectations was a 'supportive attitude'.

While a supportive attitude can occur in the absence of a positive and friendly relationship, certainly these findings indicate that together these relational qualities may produce more satisfied and successful students. Indeed, when ranking 10 accepted supervisor roles (director, facilitator, adviser, teacher, guide, critic, freedom giver, supporter, friend and manager; from Brown & Atkins, 1988), the only role ranked as equally important by both supervisors and students was that of supporter. Of interest, critic and freedom giver were equally highly ranked by supervisors, whereas students thought facilitator, followed by teacher, were the most important supervisor roles (Orellana et al., 2016). Clearly, there is some disparity between what students say they need and what supervisors think students need.

Positive supervision relationships are made more challenging by the physical distance and more formal style of communication fostered through the use of technology as opposed to the more informal communication styles that develop through face-to-face interactions (Nasiri & Mafakheri, 2015). Supervisors, who experience pressure to publish, often high teaching and marking load, as well as administrative work, may seem curt and unapproachable in written correspondence lacking the detail and diplomacy often provided by the use of tone and expression. The absence of interpersonal knowledge between online students and supervisors, coupled with the more formal style of communication that occurs in an asynchronous format, may lead to each developing inaccurate perceptions of the other in terms of ability, responsiveness and intrapersonal qualities (Nasiri & Mafakheri, 2015). Relatedly, differing levels of computer literacy between students and between students and supervisors, as well as changing technology, add to this already challenging relational context.

It seems that there are three key areas of focus to address online students' feelings of disconnection and isolation: positive supervisor–student relationships; supportive peer relationships; and intelligent use of appropriate technology.

27.4 Reflections and Recommendations

27.4.1 Positive Supervisor–Student Relationships

Academics seeking to supervise research students online should be aware of the unique challenges of these arrangements and should establish consistent strategies to counter potential problems while being mindful of the needs of different students. Early in the supervision relationship, supervisors should set clear expectations around amount and timing of contact, attendance at meetings, type and timing of feedback and the roles and tasks appropriate for both supervisor and student. In the early phases of the supervision relationship, in particular, supervisors should focus on developing rapport with students, and laying foundations for a friendly, open and interactive ongoing relationship. Contact should ideally be both synchronous and asynchronous, using video conferencing where possible to enable rapport-building and relationship development. Supervisors should also be aware of tone and language in written communication especially. Clarity and detail in responses are important to avoid multiple possible interpretations and back-and-forth emailing, and tone should not be too formal as this might lead students to feel like they are a nuisance, resulting in disengagement and dissatisfaction (Nasiri & Mafakheri, 2015). Maintaining appropriate boundaries, while trying to foster a positive relationship in which the student feels like an equally valuable partner, may be challenging, particularly in an online and high-pressure space. Universities offering online research programmes might benefit from introducing supervisor training specifically focused on online relationship development, and how to increase student engagement with the course and with each other.

27.4.2 Supportive Peer Relationships

On-campus students benefit from shared work and leisure spaces, and regular lab group meetings in which they can engage and develop their own relationships with other students. As much as possible, online supervisors should try to emulate this with their online students; of the three areas highlighted above, this is likely the most difficult. Early expectation setting may assist here. For example, supervisors might run a compulsory weekly group videoconferencing session online in which students bring questions, pieces of writing they are working on, or prepare discussions of papers to present. In such sessions, it can often fall to the supervisor to lead the session and respond to questions, so using break-out room functioning to separate students into smaller groups or pairs may help in prompting interaction without a focus on the supervisor.

From a structural perspective, projects can be designed to cater for two or more students, requiring them to work together on the development of materials or experiments, as well as on pieces for publication or presentation at conferences (which

also enables broader networking opportunities—another aspect of research that is often lacking for online students). Supervisors might also encourage students to be in communication with each other outside of group meetings, although the responsibility for this does fall to students to follow through. Appropriate use of technology is likely to be the best way to start students interacting with each other and may facilitate ongoing communication and support.

27.4.3 Using Technology in Education and Supervision

There are a number of technologies currently available to aid in both synchronous and asynchronous communication. Applications such as zoom, skype and blackboard collaborate all offer video conferencing services while email, slack, WhatsApp, trello and moodle work well for asynchronous communication. Key, though, is how these are used. Social media provides a further platform for students to engage with supervisors and peers, but is not without drawbacks (e.g. depending on how people use their social media, this may blur the boundary between professional and personal more than is appropriate). Initially, students should be introduced to the different technologies to be used via either live or recorded training sessions. This will enable supervisors to focus on developing rapport and positive relationships with students, rather than dedicating the limited time they have to teach students about the technology.

Online students and supervisors should meet via video conferencing with at least the same regularity as on-campus students and supervisors, and these meetings should ideally be recorded for later reference. Face-to-face meetings, even via conferencing software, enable a more rapid building of rapport and allow students and supervisors to 'get to know each other' more readily than any other form of communication, which is critical in enabling connection. Meeting in this way enables each individual to see the other as a real person, a distinction which can become blurred in online communication. Similarly, group meetings can be used to facilitate relationship development between students. The use of instant messaging software and social media (e.g. slack, WhatsApp, Facebook messenger, or a Facebook group) enables real time and asynchronous communication and support between students, and can be overseen and moderated by the supervisor as required. The more informal style of communication common to these tools may also aid in building relationships, but should be used with care. Slack has the additional ability to create and name multiple threads, so students and supervisors can talk about specific topics in isolation without discussion becoming lost in a sea of consecutive messages as it might in other forums.

The use of a Facebook group may help to personalise individuals by linking their personal profile and images with their postings, and to increase interaction through targeting, a tool already used by most people. Pimmer et al. (2017) found that in terms of relational development, the use of a closed Facebook group increased socio-emotional interaction between students and supervisors, and to a lesser extent between students. However, the inbuilt functionality and structure of Facebook meant that a number of postings were missed, leading to repetition of information and

frustration. Trello, essentially an online, interactive notice board, might be useful in conjunction with a Facebook group or other messaging system. Trello enables each board user to create and move tasks between phases of research or different projects, in whatever way the board owner sets it up. In terms of student management, this tool is useful for supervisors to be able to see at a glance what each student has completed, is currently working on and what they still need to complete, which can save time and encourage students to keep up to date.

27.5 Conclusion

In summary, informed use of a variety of technologies, as well as pre-supervision training sessions, setting expectations and structure, flexibility and communication styles, all play a part in the development of positive and successful online relationships between students, and between students and supervisors. Academics considering online supervision should be familiar with the challenges involved, educate themselves on various technologies that might be useful, and create opportunities for students to connect with each other outside of the supervision relationship.

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Chapter 28
Climbing Aboard the Online Research MO-PED—Fuelling Good Online Education Outcomes with Good Online Research Programmes

Stephen McKenzie, Filia Garivaldis, and Kyle R. Dyer

Abstract Online education is our brave new education world, providing unique challenges and opportunities for its rapidly growing numbers of students, instructors and course developers. The brave new opportunities of online education include an opportunity for online course educators to develop, teach and refine online courses based on empirical evidence of the comparative value of various online course feature possibilities. Basing online course development on research evidence allows online education best practice. As such, online education research programmes are increasingly necessary to guide the optimal advance of online education. This chapter describes the development, implementation and lessons learned by a particular early online education research programme—the Monash Online—Psychology Education Division (MO-PED). The MO-PED was started to support the research evidence-based development and refinement of a particular course—Monash University's fully online fourth-year level Graduate Diploma of Psychology Advanced (GDPA)—and grew to support non course specific online education research and associated research collaborations. The key MO-PED online education research collaboration has been with King's College London's Institute of Psychiatry, Psychology and Neuroscience (IoPPN). MO-PED's online education research has included explorations of the importance of building an online sense of community, understanding the drivers and barriers of effective online study, and with King's College, London, investigating the benefits of online mindfulness course components.

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28.1 Introduction

With the proliferation of online education courses, it is becoming increasingly important that teaching and learning practices that support these courses involve more than a translation of on-campus materials into an online format (Grant & Thornton, 2007; Rovai & Downey, 2010; Roddy et al., 2017). As well as maximising the opportunities offered by the new medium, optimal online course development also needs to be based on empirical evidence of what constitutes optimal online teaching and learning. Characteristics of online teachers and learners and how these differ from on-campus characteristics need to be researched and understood. A barrier to the creation and expansion of optimal online courses has been a reliance of course developers and teachers on following what has already been done, rather than on fully exploring possibilities for developing, refining, teaching and learning online course content that fully realise the possibilities of this education medium. To achieve optimal online course success there needs to be a research-based understanding of online course best practice, including via basing online course components on research evidence, rather than on untested assumptions, education habits and guesses. Simply making content available and accessible online does not make full use of the features of educational technology and the vastness of options of the online mode.

A recognition of the need for consideration of research evidence for online course development, refinement, teaching and learning led to the creation of an innovative online education research programme, the Monash Online—Psychology Education Division (MO-PED). This was in response to a growing recognition that research in online education best practice was sporadic and minimal. The vision of MO-PED is "To develop and inform evidence-based innovations in digital pedagogy, and to lead the global education community towards best practice in online teaching and learning—with particular consideration given to using psychological factors to improve and advance the experience of learners and educators."

The MO-PED initially aimed to provide a research evidence base to inform ongoing refinements of the innovative new online course—Monash University's Graduate Diploma of Psychology Advanced (GDPA)—which started with approximately 80 students in March 2016, and grew rapidly to now deliver online education to over 500 students. MO-PED soon grew to meet the increasingly important need for systematic, collaborative and international online education research that potentially supports the development and refinement of many online courses.

The MO-PED initiative attracted interest from a variety of online educators from within and outside of the discipline that MO-PED originated within—psychology. Members joined MO-PED because they were interested in making effective teaching and learning decisions and because they could engage in research that furthered and advanced their teaching practice. The group grew from two initial founders to a team of 10–15 active and non-active researchers, who met fortnightly to discuss research progress, provide collaborative support of each other's research initiatives and discuss strategic development.

The expansion of the MO-PED culminated in an online research supporting Memorandum of Understanding g signed between Monash University, Melbourne, and King's College. London, in January 2017. Early results of this international collaboration have included the research partners' co-hosting of an online education research symposium and associated workshops in Melbourne in February 2018, and a smaller scale symposium in February 2019. Both events comprised a wide range of presentations, including from Monash and King's College online researchers.

28.2 MO-PED Research Projects

The MO-PED aims to help online course development be informed by an evidence-based quality research agenda. The MO-PED online education research programme has allowed a unique and uniquely valuable integration of scholarship, research and professional activities with teaching in support of student learning across three key performance indicators (Fig. 28.1).

MO-PED researchers have conducted research into online education areas related specifically to the Psychology discipline and into online education in general. Current and future MO-PED research aligns with the KPIs above, and is listed in the Table 28.1.

There has also been an integrative review of online learning, teaching and support best practice (Roddy et al., 2017) produced by the MO-PED team, and research

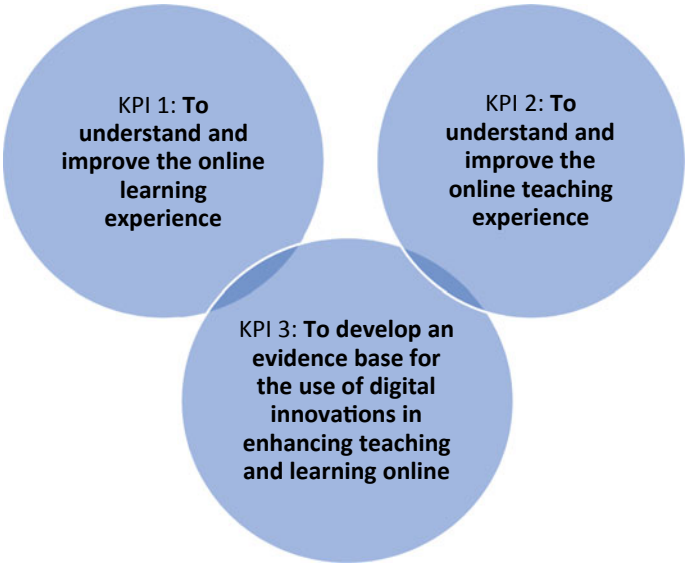

Fig. 28.1 The MO-PED's areas of online education research

Table 28.1 Research projects and publications, KPIs, and outputs, FY2016-2020

Research project	KPIs	Output
Understanding dissent and aggression in online education	1	Shaw and Barker (2020)
Discipline-specific predictors of student success	1	Arulkadacham (2020)
Online teaching success	2	Burke (2020)
Online supervision success	2	Tatnell (2020)
Online student well-being	2, 3	Chung and McKenzie (2020)
Online student work readiness	1, 2, 3	Schweinsberg and Garivaldis (2020)
The effectiveness of a fully online psychology careers unit	2, 3	
The use of immersive multimedia activities using simulation to teach ethical decision-making	1, 2, 3	
The value of formative feedback in online education	1, 2	
The work engagement of remote online education staff	2	

studies conducted directly within the Monash University—King's College online education research collaboration.

28.2.1 Applying Best Practice Online Learning, Teaching and Support to Intensive Online Environments

This research investigated specific and general online student success predictors, to identify online student skill development and need responses that enhance student success including by achieving a flexible, interactive learning approach. Online students need to interact with their learning environment and with other learners in meaningful ways, and achieve high levels of self-regulated learning, particularly in the absence of physical infrastructure, and they need to be encouraged and helped to create their own interactive learning community.

Key determinants of online education best practice that came out of this research include the need for:

- Optimal instructor presence, which is a critical factor in all modes of online study, and particularly in intensive online environments, where instructors need to establish and maintain student engagement relatively quickly,
- Recognising and allowing for individual differences in learner competencies, characteristics, and preferred learning approaches, particularly with the demographic differences between online and on-campus cohorts.

- Identifying and responding to potential learning and learning related barriers that can lead to increased student attrition, such as perceived isolation, competing for work/family commitments, poor motivation, lack of engagement with content and technical challenges,
- Recognising and responding to time pressures evident in an intensive online course,
- Providing comprehensive and online relevant orientation services,
- Good communication, including between students, as well as between students and instructors,
- Good technical support, that quickly and flexibly addresses any technical issues that arise,
- The provision of online well-being content such as mindfulness resources.

"Future research is needed to continue deepening our evolving understanding of online education best practice." (Roddy et al., 2017, p. 8).

28.2.2 Monash University—King's College, London Online Education Research Programme

This pioneering international online education research collaboration operates within the context of a Memorandum of Understanding, signed in February 2017, between two prestigious universities that are successfully expanding their online course offerings and their online research evidence base.

Monash University, Melbourne is Australia's largest University, and a member of Australia's prestigious "Group of 8" group of universities. Monash is developing and implementing pioneering online courses and course supporting entities including:

- The Monash Online Education Community of Practice (MOEC, described in Chap. 33 of this book), which is an internal community of online education stakeholders,
- A University-wide online student orientation site, the Monash Online Learning Hub (MUHL, described in Chap. 33 of this book),
- A range of online education approaches across all faculties and levels, including—Australia's first fourth-year level fully online Graduate Diploma of Psychology Advanced (GDPA) School of Psychological Sciences, described by a competitor as the gold standard in Australian online psychology education, and the off-campus expert Master of Transport and Traffic, Department of Civil Engineering.

King's College, London, is a top 10 European university, and its prestigious Institute of Psychiatry, Psychology and Neuroscience (IoPPN), is world-renowned for the quality of its research, producing more highly cited publications in psychiatry and mental health (Scopus, 2016), than any other university in the world. In 2014, Research Excellence Framework, the IoPPN was judged to have the second-highest research power in the UK, for Psychology, Psychiatry and Neuroscience, and the

impact of its work was 100% world leading or internationally excellent, while the research environment was judged as 100% world leading. IoPPN is the world number one ranked institution for research in its area. King's College's loPPN has developed and offers a suite of online Master's courses in the Neuroscience area which have large student numbers.

The Monash—King's collaborative online teaching, learning and student support/well-being research project was conceived in July, 2016, as a result of the mutual recognition by its partners that to fully realise online education's vast potential it needs to be supported by systematic online education research and research partnerships. The collaboration can potentially produce valuable online research and online research related educational outcomes, and have so far included:

- Two Monash—King's led online education research symposiums held in Melbourne in February 2018 and 2019,
- A Monash—King's jointly supervised Ph.D. project investigating online student well-being and well-being related and other non-academic predictors of student success,
- A Monash—King's jointly supervised Ph.D. project investigating online student work readiness,
- A UK grant-funded collaborative research project that is evaluating and comparing the implementation of GDPA mindfulness course components into King's College and other Monash University online and non-online courses.

28.3 Reflections and Recommendations

Our reflections on the MO-PED's online education research journey so far are mixed, and our recommendations are for what to avoid in developing an online education research programme, as well as for what to pursue.

There have been important MO-PED successes including the online education research momentum and collective energy that has been achieved with the development of a formal online education research programme, which reinforced and formalised ongoing course re-development and feature improvement. The experiences of the team support the idea that it is far more effective and rewarding to conduct online education research and online education research-based course improvements as a team than it is as an individual, or as an individual course.

As well as formalising and strengthening a within course improvement process and establishing an international collaboration, an important success of the MO-PED was its contribution to a growing general recognition of the importance of basing online course development and improvement on objective evidence. Online education research is increasingly helping online educators recognise the special and unique challenges and opportunities of this still pioneering medium.

Challenges that have been encountered on MO-PED's research road have included an ongoing lack of research support resources, that comes from an assumption that online education does not differ from the on-campus mode of education, and hence

does not require its own research evidence generating capacity. As a result, little to no time was allowed to the main teaching focused staff working on the MO-PED to devote the time required to capture and measure great and valuable research related educational outcomes. Some specific recommendations based on learnings from the MO-PED's online research road are:

- Online course leaders, as well as educators and developers, need to recognise the value of online course creations and improvements being based on research evidence, rather than based on best guesses, unquestioned assumptions, what has previously been done, or what is done on-campus,
- Online course leaders need to invest in online education research that supports the optimal development, and therefore, the ultimate profitability of online courses, and invest in online course staffing models that allow online teaching staff the opportunity to also be online education research staff,
- Online course educators need to look for opportunities to combine online education with online education research in ways that are valuable to both. An example of this mutually valuable bringing together of online education practice and research is moving from an observation, such as that online students seem to be more volatile than non-online students, and the potential challenges caused by this phenomenon, to research into whether this apparent phenomenon is real, and if it is real, answering why, and how can it and its effects be addressed and improved.

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Chapter 29
Online Teaching as an Act of Design

Danah Henriksen

Abstract Online education has grown rapidly in recent decades. The COVID-19 pandemic has brought the ubiquity of online learning to new levels, alongside renewed recognition of the need for high-quality online pedagogy. In an uncertain world, educators must be prepared to teach online and potentially shift modalities as needed. While this can be daunting, it helps to remember that online teaching emerges from the same teaching principles that exist in any setting—that good teaching is an act of design. This sense of pedagogical design is foregrounded in the need for careful front-end design of online learning spaces. In this chapter, I discuss keyframing points for online instructors to use in designing online learning. This includes practical information on designing for learning goals, including design-based projects, assessment strategies, and community building tips and ideas.

29.1 Introduction

In recent decades, online education has shifted from being viewed as a lesser learning modality, to becoming widely-accepted and common educational practice. Extensive research, academic debates, and ongoing discussion have focused on good teaching practices and designs for online spaces. The COVID-19 pandemic, however, has pushed the ubiquity of online learning to new levels. This has brought a renewed recognition of the need to focus on elements of high-quality online pedagogy. Online learning will continue to expand, and educators must be prepared to teach online and potentially shift modalities as needed. This can be daunting. Shifts in teaching create a sense of shakeup, as educators are tasked with leading and preparing students for an uncertain world, and perhaps doing so in online mediums where they themselves are less comfortable.

As an educator who has taught online since 2005, I have sometimes switched between pedagogical contexts—including different modalities (face-to-face, blended or hybrid, synchronous, asynchronous, online), or different contexts, countries,

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subjects, or educational levels. I can empathize with the sense of uncertainty in shifting into new settings or contexts. Although online settings have different affordances and may require us to rethink practices to a degree—ultimately any mode of teaching is still always about crafting a pedagogy for students, through good design work. In this chapter, I will cover some general points or practices for online teaching. These are framing ideas (with a few specific details) that teachers can conceive or re-conceive of, as suits their own pedagogy.

29.2 Design for Learning Goals

What matters in online teaching is similar to what matters in face-to-face pedagogy—engaging learning activities, effective assessment practices, and students' experience—but these points are enacted differently online. Teaching is always an act of design toward a learning purpose (Henriksen & Richardson, 2017). So it helps to start by asking—what is important to me and for my students in the class, topic, lesson, or activity? That means considering: What do I want students to learn or take away? What kind of experience do I want them to have? What should they be able to do after this learning experience? This may involve gaining specific content, or skills, capacities, or meta-takeaways. After identifying the goals, a teacher can consider ways to enact these goals in an online space.

For instance, if I am teaching doctoral students core education theories (content), and how to apply these theories to real-world situations (skill or capacity), I start with the goals and then find interesting ways to feasibly support them in the online medium. I may identify possibilities for conveying the theory-based content (readings, videos, resources, or having students explore or investigate theories themselves); and then consider how students could enact this knowledge online and apply theory to practice.

For instance, in a prior face-to-face course, one activity involved students taking a class trip to a local design studio and observing how learning occurred there, then writing individual reflection journals about educational theory used in that studio. Students enjoyed the observation trip—but it was also logistically cumbersome to bring a class group off-campus. When I moved the class online, re-thinking this same activity became a necessity that actually released some logistics challenges and opened options up. Students were able to choose educational sites in their own community to observe each week (classrooms, libraries, museums, or informal learning like dance or fitness classes, etc.), and then write reflective blog posts about their observations, framed by theory from readings. They added images and reflections and reported enjoying the opportunity to choose their own local spaces, observe, and reflect, then share and learn from peers who about sites across other cities, towns or countries.

29.3 Engaging or Design-Based Projects

Since online learning can be individualistic, there is a risk of disengagement if students do not feel interested in the work or see its relevance in their lives. Projects should push learners to work with content at deeper levels, by having students first engage with course materials (from readings, discussion or video lecture), and then take the ideas to the next level to create or design something with them. Learning through the lens of design gives students opportunities and autonomy to create something (an artifact, tool, lesson, video, podcast, or anything that could be relevant in their thinking around the content).

Online learning allows and even requires autonomy—so taking advantage of this through design-based projects can build upon the affordance of learning being located outside of the traditional classroom. Further, online spaces can make sharing one's work (via blogs, videos, audio, or a range of creative technology tools) easier, allowing students to share and make learning public. It helps to think about how one can take advantage of the medium, rather than starting from a deficit model of overcoming barriers. Barriers may happen and instructors can always problem solve for solutions, but online design begins on a better design foot when starting by considering the affordances. So, rather than seeing online learning as more limited than the classroom, one might consider how it can offer more unlimited possibilities to take learning into the real world, let students connect what they are learning to their own work, context or environment, or connect them with learners from varied places, contexts, and settings.

29.4 Feedback and Assessment

Feedback and assessment are central in any teaching setting. While teachers often have their own assessment structures and philosophies which may cause a transition between settings, there are a few unique aspects online.

Students do not receive all of the same cues online that they have in a physical classroom. The immediacy of contact with each other or the teacher is not always there, so some informal conversational feedback drops away and uncertainty can increase. This can be mitigated to some degree by offering online office hours or synchronous video sessions. But there is still a need to maintain helpful and timely grades and feedback.

Setting a schedule or expectation for timing on grading/feedback (e.g. that grades/feedback will be done within a given timeframe after the assignment deadline), and sticking to the schedule, can mitigate some student anxiety in calibrating their work. Feedback that provides supportive or positive comments, as well as suggestions or areas of improvement, is helpful so that students know an instructor recognizes and has engaged with their efforts.

Much feedback in online learning happens via written text, such as comments on a paper, or grades notated in the Learning Management System (LMS). Text-based comments can be useful to allow an instructor a chance to craft a response and the student to read and think through the comments. However, online learning can also be a chance to explore more personalized and different modes of feedback, such as in video or audio format (Ryan, Henderson, & Phillips, 2019). Many LMS's provide accessible options and tools to help do this, and students often report video or audio feedback as providing a more personal, helpful experience. Henderson and Phillips (2015) offer a method of creating short (5 min or less) video or audio clips of instructor feedback for more in-depth assignments. They describe approaches which mitigate the time-intensiveness and demonstrate how students appreciate video/audio feedback. There are varied opportunities to explore modalities of online feedback. Experimenting with these modalities and learning the functionality of the LMS can help instructors develop an assessment style and schedule that works.

29.5 Building Community and Personal Connection

Building community is essential in the front-end design of online courses. Students invariably point to their favorite courses as those where they felt some connection to the instructor and peers. In face-to-face courses, this connection potentially happens emergently. But in online learning, it requires intentional and front-end course design that supports connections between students and with the instructor. Good design combats the potential for isolation, even when the instructor cannot check in regularly or spontaneously with each student (Overstreet, 2020).

Offering online office hours allows students to drop in more organically for virtual face-to-face time or direct conversation. Depending on course size, it may also help to require that students schedule at least one or two virtual conference calls with the instructor during the semester. When I have done this, I generally block off periods of time in my semester and create a spreadsheet so that students can sign up for 15 min segments. Much communication still occurs by text, however. Teachers are often busy, and may be in the habit of quick, efficient, and potentially even abrupt email responses. But in online learning, these text-based communications may drive students' perceptions of their instructor interactions. Ensuring that the tone of communications and messages are warm, supportive, and inviting goes a long way to determining how students perceive their experience.

Sending regular messages and announcements to the group (without bombarding them) is essential. In addition to informational emails, clarifications or coursework-related subjects, class messages can also include supportive or relevant quotes, poems, ideas, news stories, and topical articles, or even personal well-being resources. Students benefit from seeing an instructor's face and knowing there is a person there, so including (even occasional) video announcements is helpful. These can be brief check-ins recorded with QuickTime, Zoom or other easily-accessible software.

Students connections with each other are also vital. Although every student may not get to know every other student, it is important to have meaningful interactions and connect with at least a few other students. When it is manageable to do so, some small group work is valuable. I typically try to include at least a couple of group projects or small group discussion boards, where students can work together around a goal or have a more focused discussion together.

Asynchronous discussion thread are also a common and useful way to connect students. Having students start right off with a welcome discussion to get to know everyone—sharing a picture and whatever they feel comfortable posting about themselves—can set the tone and tell them a bit about each other. The instructor should post there too as a part of the community. Weekly discussion around the readings or topics at hand (where students are required to respond to each other) is useful. Here, it is critical to craft prompts that support open-ended critical thinking, or that allow students to connect coursework to their own experiences (Henry Hulett, 2019). Having students share their work (journals, papers, projects) with each other and give feedback is also beneficial for connecting them as a learning community.

29.6 Reflections and Recommendations

An instructor's mindset should be framed around strong front-end holistic course design, as well as building experiences, supports, and a learning rhythm and flow that allow students to both learn independently and collaboratively. Online learning involves more design up front, in mapping out an entire course of learning rather than designing or lesson-planning from week-to-week or session-to-session. But good intentional design (allowing for occasional shifts based on emergent needs) reduces angst on both the instructor's and students' parts and allows students to flourish. It creates a more positive experience and sets up a progression of learning with its own rhythm and flow—allowing for a sense of community and deep engagement with ideas.

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Chapter 30
The Application of Design Thinking to Convert an On-Campus Course for Online Students

Jaclyn Broadbent and Jason M. Lodge

Abstract Providing high-quality learning experiences for online students can be challenging. This chapter provides a case study of the use of design thinking principles to convert one of Australia's largest suite of on-campus fourth-year psychology programmes to accommodate online students. A design thinking approach was taken to better understand how the fourth-year team could meet the needs of online students in an efficient, sustainable and fiscally responsible way. This chapter will briefly discuss design thinking and how we used it to improve the student experience for online students.

30.1 Design Thinking

Design thinking is a human-centric, solutions-based, non-linear iterative approach that is used to understand the target audience, challenge one's assumptions and identify solutions for real- world problems (Brown 2009; Carlgren 2013). The approach evolved to put the end-user (in this context the student) and their needs at the centre of any development to ensure better products and services for that client, while also considering what is feasible and economically viable for the company (Brown 2009). While there are many different approaches to design thinking, typically, design thinking is seen as a process with multiple stages ranging from three (e.g. Brown 2009) to seven stages (e.g. Kumar 2013), that are linear, circular, chaotic, occur concurrently and/or loop back and forth between themselves. Many implementations of design thinking incorporate a multidisciplinary team, who synthesise information

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from a variety of perspectives, and then apply different yet complementary skill sets to the problem.

This online education case study adopted a five-phase model of design thinking developed by the Hasso-Plattner Institute of Design at Stanford (Platter 2010), based on Simon Herbert's (1969) design. While design thinking models such as that developed by the Hasso-Plattner Institute have been criticised for oversimplifying the design process (e.g. Hernández-Ramírez 2018), these models do, at a minimum, provide a mechanism for breaking down what are otherwise highly complex design challenges. The stages of the five-phase model are: empathise, define the problem, ideate, prototype and testing. The first phase, empathise, is about understanding the end-user and the challenges you are trying to address. The second stage is about defining the problem, including insights from multiple sources, which is synthesised together into a meaningful whole that can be used to generate solutions. Phase three, Ideate, is about being open-minded and generating multiple ideas. The Phototype phase, stage four, is about bringing the ideas into action, and to share them with others in the team. The last stage, testing, is actioning the ideas and getting feedback in order to build on and refine the ideas. These phases can be linear, cyclical and iterative, and the process can move back forth between stages (see Fig. 30.1).

An important distinction between design thinking and other design methods is the former's solution-focussed, rather than problem-focussed, approach. Focusing on solutions allows design thinkers to cast a broader lens to problem-solving. Instead of asking, for example, 'How do we reduce attrition rates of students?', design thinking would ask, 'How do we improve the student experience?' For this reason, design thinking is particularly useful for problems that are difficult to define, ever-evolving and that require creative problem-solving (Leblanc 2008; Wrigley and Straker 2017). The application of the design thinking process is considered successful when the

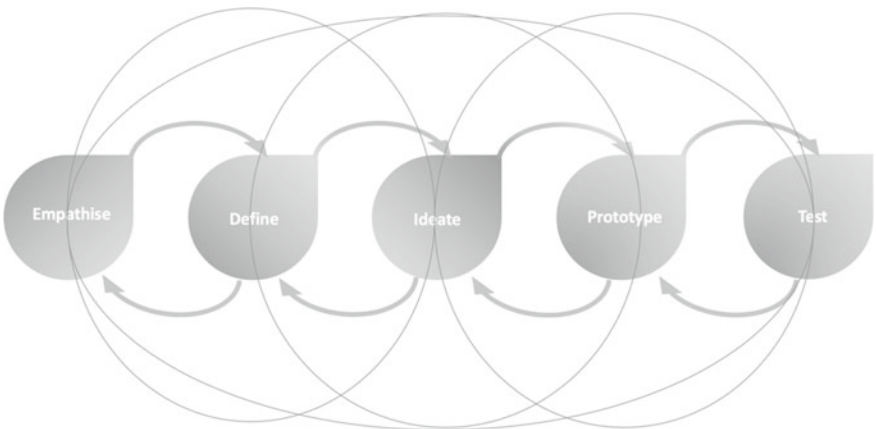

Fig. 30.1 The phases of design thinking (adapted from Hasso-Plattner Institute of Design)

solution is deemed to be attractive to the client (e.g., the students have a good experience), the problem is reduced (e.g., attrition rates go down) and the company (e.g., the University) considers the solution feasible and economically viable (Brown 2009).

The field of education has yet to fully embrace design thinking when delivering and designing courses in the higher education sector. However, that is not to say that design thinking is not occurring. Bennett et al. (2016) described the complex process by which individual academics engage in the intuitive design of the curriculum. So, there is already a process in place where teachers in this context engage in design thinking. On top of this, professional staff positions with a focus on design for learning have been increasing in many institutions. Despite the existence of these processes and the emergence of these roles, most of the design thinking research has focused on developing design thinking skills in students (e.g. Charosky et al. 2018; Scheer et al. 2012), as opposed to using design thinking to shape the design of curriculum (although there are some exceptions to this; e.g., Anderson et al. 2017, as well as McLaughlan and Lodge 2019). There are significant challenges associated with engaging expert academics from disciplines that do not fundamentally engage in processes akin to those in design thinking (Elliott and Lodge 2017). Consequently, despite the apparent benefits of design in the creation and delivery of higher education, there has been less uptake in design thinking than could otherwise be expected and further research is needed to determine how design thinking can enhance teaching practice in this context.

Notwithstanding the lack of research for this sector, there are reasons to suspect that design thinking would be useful. First, design thinking has been successfully implemented across markedly different settings, and hence seems sufficiently flexible to facilitate improvements across many diverse contexts—so why not education too? (Koh et al. 2015). Second, education has always included design (Goodyear 2015). Teaching staff regularly engage in curriculum design, assessment design, curriculum alignment, instructional design and pedagogical design in fulfilment of the teaching obligations of their positions (Bennett et al. 2016). Lastly, design thinking can be adapted to a range of teaching problems such as helping specific students, working on an assessment task, structural changes across units and whole courses, etc. It can also provide a framework for when you want to step away from doing things 'the way they always have been done'.

Based on Platter's (2010) five-stage model of design thinking, this chapter outlines the design thinking approach taken to enhance the educational experience of online students in a course that was initially developed for face-to-face students. We will first outline the educational context where the redevelopment occurred, then what was achieved with a focus on designing easy to navigate content, improving a sense of belonging for students and increased teacher presence and guidance through the course.

30.2 The Context

Psychology fourth-year programmes in Australia, are a pre-professional year for psychology graduates; successful completion of this course allows students to register as a provisional psychologist and to apply for professional postgraduate programmes in psychology (e.g., Masters or Doctorate in Clinical Psychology). At Deakin University, these programmes consist of four coursework subjects, which have exams and assessment, and four research project thesis subjects which culminates in a research thesis at the end of the year. In 2019, this suite of courses had an annual intake of over 300 students. Due to the need to expand our course to include online students, it was the perfect time to redevelop the course in its entirety.

As design thinking puts user experience at the centre (Brown 2009), it seemed like an excellent fit to guide the redevelopment. We also needed a framework that would challenge the status quo approach to course delivery, and that would encourage us to question some of the underlying previous assumptions we had been working from and put the student at the centre of these changes. Instead of focusing on the problem 'How do we convert the face-to-face programme to the online learning environment?', design thinking principles encouraged us to instead focus on the solution, 'What would make for a good online student experience?'. In 2018, we opened enrolments to 30 online students, which we expanded to nearly 80 students in 2019. Below is a brief discussion of the key changes we made in the redevelopment of the course to accommodate online students.

30.3 What We Did

Based on basic design thinking principles (e.g. Platter 2010), we involved a multidisciplinary team in the course redevelopment, including teaching and learning experts, learning designers, content experts, IT experts and professional and support staff. The team initially met fortnightly, and in the second year met monthly. During the empathise stage (stage 1), we spent the first semester of 2018, trying to understand the experiences that the students were having in our course. Immersion into the whole programme, not just single subjects, gave the team important information about the student journey through the life cycle of the course. We spoke to students, research project supervisors and teaching staff. We audited discussion boards and class announcements from previous years, to identify sticking points for students, and the type of communication students received from the staff.

In the second stage, defining the problem, we brought together the information gleaned from the empathise stage. In this case, that resulted in a wall of post-it notes in the first author's office, that had been gathered over the preceding months. The post-it notes mapped the pain points of the student journey across the course of the year from admissions to graduation. Rather than focusing on all the individual problems written on a post-it note, design thinking moved us to define the problem

from a solution-focused perspective. We were left with the question, 'What would make a good online student experience?'.

The third stage, Ideate, was used to generate ideas. The ideas that were generated by the team fit into three broad themes: (1) the need for easy to navigate self-guiding online content, (2) improved sense of belonging and (3) increased teacher presence and guidance throughout the course. In the following sections, these three broad themes will be used to illustrate some of the key changes we made in response to each theme. As part of this stage, we also challenged our own assumptions about who the students were and what needs they had.

In the fourth learning design stage, prototyping, we started designing our ideas and testing them out first within the team. Next, we tested them in the course with the students (stage five: testing). As it is written here, it sounds as though our development moved in sequential order, but as time progressed we repeatedly cycled back and forth between the stages in response to accumulated student feedback. Some of that feedback resulted in us going back to stage one to fill in the gaps of the student journey that we had missed earlier. Other feedback resulted in generating new ideas, or making a new prototype of a product or service. We did not get everything right the first time we implemented a change. Iterative changes, a design thinking principle, were key for us to be sufficiently agile take on feedback from students and modify as we went. For more substantial changes that required University approval, this flexible, iterative approach meant we could implement in stages what could not be implemented immediately. The design thinking process and the redevelopment of the course are still ongoing. As mentioned previously, the design process is messy and iterative. However, below are three of the themes we derived from the Ideate stage accompanied by the changes we made. Each will be discussed in turn.

30.3.1 Theme 1: Easy to Navigate Self-Guiding Online Content

What was apparent from talking with students and auditing the discussion boards on our learning management system was that the student experience was worsened when the resources provided to students were difficult to find, hard to navigate and gave little information about how to progress each week. Moreover, online students who were required to study autonomously found it challenging to self-guide their learning. For this theme, in particular, prototyping was very important, because we wanted the online resources to be clear to navigate, easy to use and consistent across subjects. We tested multiple prototypes of resource templates within the group, before finally settling on one that was implemented in year two of the redesign. Below is a description and a picture of the resources template. Feedback gathered from students and staff in year two will be used in year three to refine the template.

We designed a template to help the students seamlessly move through the content for each week with high teacher presence, time management strategies, practice

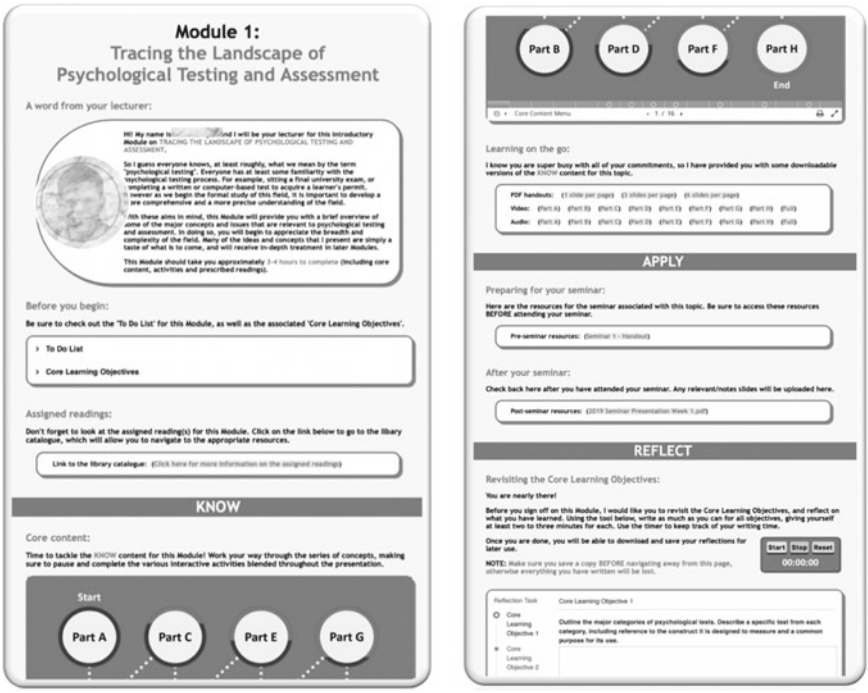

Fig. 30.2 An example of the redesigned online resource template

tasks and activities and links to subject learning outcomes. We removed face-to-face lectures and replaced them with a 'know' section in each module. The 'know' section contained multiple short videos (<10 min) broken up with activities (using H5P objects), which related to the content knowledge students needed each week. 'Learning on the go' in this section provide the content in multiple formats to provide students with flexibility in delivery. An 'apply' section was added to each module for the practical application of the content that would be required for that week's content. Located students attended weekly face-to-face seminars, while *Blackboard Collaborate Ultra* was used to run online live, and recorded seminars for online students. The 'reflection' section allowed the students to test their knowledge regarding the learning objectives for the week. See Fig. 30.2, for an example of this.

30.3.2 Theme 2: Improved Sense of Belonging

A key challenge in taking on-campus content and making it available online was understanding how the online student, the on-campus student, the part-time and the full-time student come together and identify as belonging to the course. From what we had learned, it was clear that there was a lack of cohesion within the overall

cohort. Improving the student experience, therefore, required asking, 'How do we create a sense of belonging for online students who may be located hundreds of kilometres from the on-campus students and each other?' Within this theme, some of the testing with students (stage 5) did not achieve the desired outcome, resulting in cycling back to the empathising stage (stage 1), generating new ideas (stage 3) and testing them again; thankfully, this iteration led to the desired outcome.

An example of where our second attempt was more successful than our first attempt was in the development of weekly symposia. In year one, the topics were not attractive to students to ensure regular attendance, and the execution was not engaging for online students. In year two, we focused on using the weekly symposia as a way to bring the cohorts together (both online and face-to-face). The number of topics was reduced, the range diversified and our focus in redevelopment was on what was most useful for or popular with the students. One stream focused on bringing clinicians of different specialities (forensic psychology, organisational psychology, etc.) to talk to students about what they do in their job. Another stream concentrated on future employability, with a focus on jobs available with their current qualification. A third stream discussed a range of future study pathways, and a fourth focused on exposing students to inspiring researchers within the School. Lastly, special symposia were designed to help students with their year-long research projects.

As well as academic staff, external guests, external organisations, graduate and current postgraduate students were brought in as guests. To bridge the gap for online students, we use *Skype for Business* so that online students can dial into the meeting, and they can see and hear the presenter in real time. We use *Poll EveryWhere* so that online and on-campus students can interact together, as well as with the presenter to ask questions or answer activities. We record the sessions using *Mediasite* so that online students who cannot attend because of other commitments can watch the recording at a later date. Attendance was strong, with 80–140 face-to-face students and 35–45 online students attending each week.

We also increased a sense of belonging via the use of *Facebook* to provide a space for online and on-campus students to socialise together. It also provided a space for interaction between teaching staff and students that was more informal than the LMS discussion boards. In this space we have Friday's Furry Friends (a collection of pets shared by students), we post important notices, answer student queries and student (and staff) post funny pictures during assessment time to relieve stress. Nearly 100% of the students joined this Facebook group in 2019.

30.3.3 Theme 3: Increased Teacher Presence and Guidance Throughout the Course

Guidance throughout the course and a sense of active engagement from and with the teaching staff was another important theme for online students. Online students do not have the luxury of walking into a teacher's office to ask a question and rely

more on self-guided activities such as working through the weekly content. While most of the changes described below were straight forward to implement, they were all not applied at once. Instead, they were implemented iterative, tweaked based on feedback and then the next thing was implemented.

We increased teacher presence and guidance in several ways. In each online module, we had a picture and a word from the lecturer providing the content for that week (see Fig. 30.2). We improved communication in the subjects. We streamlined the online discussion boards. We made a template for the Newsfeed across the six subjects, which included a weekly Monday morning post of what they needed to achieve for the week. We introduced an Assessment planner, which is a calendar for students that included when their assessment was due, when they had information from class to start the assessment, key milestones and when they would receive feedback on the assessment across the course. We developed emails that were sent automatically to students based on criteria such as study mode. For example, online students were emailed in the first few weeks of the teaching period to make sure they were finding their way around the course without difficulty. Students with extensions were checked on, and students who were awarded HDs were sent a congratulatory email. All of these student-centred communications helped the online students feel like the teaching staff were playing an active role in their learning and shepherding them through their course.

30.4 Reflections and Recommendations

The redevelopment of our fourth-year Honours programme is ongoing. For us, taking a design thinking approach was iterative, with multiple feedback loops which inform what to do next. We believe that taking a student-centric approach, involving a multi-discipline team, was a valid and successful way to understand what was desirable from the student perspective, while approaching curriculum redevelopment from a feasible, and it is a financially viable way.

Our lessons learned and recommendations from taking a design thinking approach to converting an on-campus course to a course including online students include:

- Understanding that a cohort of students requires an iterative education development process that requires planning, testing and reflective practices. Factoring in a need for iteration is important as you may not get it right the first time
- A substantial part of course design comes in the planning phase. It was challenging to get teaching staff to plan so many iterative steps months and years in advance, while being agile and flexible to change plans based on feedback we were receiving.
- It took time for teaching staff, who had taught in the course a long time, to tackle problems from a different angle or perspective.
- Mapping different students' journeys were crucial in understanding the pain points students were experiencing and where we could do better.

- Lastly, redevelopment takes time, and due to the constraints related to how the higher education system operates, we decided to take a three-year iterative approach to the changes that we were making. We have documented the first two years of this process here.

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Chapter 31
The Experience of Designing, Mentoring and Participating in the Mindfulness for Well-Being and Peak Performance MOOC

Adrian Devey, Sherelle Connaughton, Alexandra Nance, Richard Chambers, and Craig Hassed

Abstract Chapter 25 of this book provided a comprehensive sense of what it was like designing the content of the Mindfulness for Well-being and Peak Performance (MWPP) course and reflections on key insights and lessons learned from delivering it. This chapter provides additional detail about what it is like to design, oversee, mentor and participate in the course. In this companion chapter to Chapter. 25, we present three different mindful MOOC perspectives. Mr. Adrian Devey is the Senior Advisor (Academic Programmes) at Monash and oversees all MOOCs offered by the university. Dr. Sherelle Connaughton is the most experienced mentor on MWPP (as well as our second mindfulness MOOC, *Maintaining a Mindful Life*). Sherelle also makes occasional cameos in the recording studio to film additional content for both courses. Ms Alexandra Nance is a Ph.D. student in conservation biology and completed MWPP in 2018, to help re-establish a formal mindfulness practice to help manage the pressures of postgraduate study.

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31.1 The Design Context for the Course

The critical first steps to designing any new MOOC are to consider (a) the audience, (b) the purpose of the course and (c) the level of the course. Given that the course was to be delivered on the FutureLearn platform, the audience was global. Although the largest learner numbers were likely to be from the UK (with FutureLearn a UK-based platform) and Australia, we knew from our earlier MOOCs to expect a diverse cohort.

31.2 Our Experience of Designing, Building, Administering and Overseeing an Online Mindfulness Course—Adrian Devey

In terms of the purpose of the course, Monash University is a world leader in the teaching of mindfulness thanks to the work of Craig Hassed and Richard Chambers to embed mindfulness in the curriculum as well as offering a range of extra-curricular programmes to students and staff. A MOOC would not only make an introduction to mindfulness available to all Monash staff and students, regardless of location, but could take Craig and Richard's approach to mindfulness to a global audience.

The MOOC also provided the opportunity for research at scale. Learners were invited to complete an anonymous standard 40-item survey in weeks 1 and 6 of the first two runs of the course, as a measure of their own personal development across the course. They were also given the option to share the results with Craig and Richard to help inform research on the effectiveness of online mindfulness training in improving wellbeing and performance.

As with the on-campus programmes, the mindfulness MOOC had to be evidence-based, to address the inevitable scepticism in a broad and diverse audience. It also had to be of immediate practical benefit to learners, given the need to hook MOOC learners into a course quickly or risk losing them. The focus of the course is reflected in the title, *Mindfulness for Wellbeing and Peak Performance*, whether in study or work. As an introductory course, no prior knowledge or experience of mindfulness was assumed.

Volume of learning is another critical design decision, defined as course length x hours of study per week. At the time the Mindfulness MOOC was being conceived and designed, MOOCs were longer than they are today. Monash had launched courses of between 5 and 7 weeks duration, and we settled upon six weeks for *Mindfulness for Wellbeing and Peak Performance.* This reflected the typical length of face-to-face mindfulness courses offered at Monash. To keep the course load manageable, we settled on the expectation of 3–4 h of study per week. This covered core content, reflective practice, and engagement with online discussions. However, learner engagement with mindfulness is highly personal, and learner feedback on the hours spent on the course shows considerable variation.

31.2.1 Design Principles

Monash chose to offer our MOOCs on FutureLearn because of the alignment between the University's course design principles and those of FutureLearn—in particular, the emphasis on active and social learning. Further, course structure and navigation must be sufficiently clear for learners who are new to online learning, and the standard FutureLearn structure of breaking a course into weeks, activities (learning topics) and steps (individual learning activities) provides this. Monash built on this structure by adding our own house style of instructional scaffolding, making it as clear as possible what learners have to do in each step of the course.

The design of the Mindfulness MOOC had to include an appropriate balance of content acquisition steps (through videos to view and articles to read) and opportunities to apply this new knowledge, then reflect upon and discuss the experience. Discussion is kept within the platform, rather than via external channels such as social media, aided by every learning step on the FutureLearn platform having a discussion board attached, with the exception of quizzes and tests.

Social learning is further encouraged by carefully written discussion questions, called 'Talking Points' in the Monash house style. While the Talking Point questions in video and article steps encourage deeper discussion of the content just presented, each topic in the course is rounded off with what we have called a 'Reflect and Connect' discussion step, built around questions that stimulate broader discussion.

How to assess a MOOC is another key design decision. For a MOOC with no tutor-marked assignments, FutureLearn offers formative multiple-choice question (MCQ) quizzes and summative MCQ tests. For MWPP, we decided that while well-written quizzes could provide a learning opportunity for learners to engage more deeply with the course content, a summative MCQ test was not appropriate.

Finally, the principle of 'create once, use multiple times' is important to the financial sustainability of MOOC development at Monash. In parallel with the MOOC, Craig and Richard were also working on the development of an online mindfulness professional development module for academic staff at Monash. Where there was an overlap of content, the learning assets created were shared across both projects.

31.2.2 Course Design, Development and Build

A formal proposal to fund MWPP was approved by the University in November 2014. FutureLearn approved the course in January 2015 for launch in September of that year. This allowed detailed course design, development and course build on the FutureLearn platform to commence, led by Mr. Rowan Peter (Advisor, Digital Learning and Teaching in the central Education Portfolio).

The backwards design process was used, starting with creating a clear set of learning outcomes for the course, then considering what learning activities are required for learners to be able to achieve and demonstrate those outcomes.

31.2.3 Learning Outcomes (6-Week MWPP Course)

- Identify the causes of stress in your life
- Experiment with a range of mindfulness techniques
- Develop a range of mindfulness techniques that are effective in your life
- Evaluate the impact of a variety of mindfulness techniques
- Reflect on your experiences in a personal mindfulness journal
- Model a more mindful approach to work, study and life.

Working from macro to micro, learning activities were mapped across the six weeks of the course. Consideration was then given to what content resources were required. Being the most resource-intensive to produce, particular consideration was given to what videos were required (including a promotional trailer and 'Welcome to Course' and 'Welcome to Week' videos). While external videographers were used to film the course trailer in March 2015, other videos for the course were recorded in the University's prototype micro-studio—an essential facility for reducing the cost of producing this and other MOOCs. Accessibility is another important design principle for Monash and FutureLearn. Videos can be downloaded for later viewing, and a transcript and subtitles are provided for every video.

The development process also involved the University Copyright Adviser in assessing any potential copyright issues in using chosen academic resources, images and music in the course. Wherever possible, we used open access resources.

The overall course map was completed in early February 2015, and detailed weekly course maps by early March. Rather than attempt to author course material directly into the FutureLearn platform, the course team worked in shared documents to storyboard each step of each week of the course. Only once each step had been edited and approved by Craig and Richard did Rowan author the step in FutureLearn.

The first run of the course opened on FutureLearn for learner registrations in June. Course build was completed by the end of July, and the course handed over to FutureLearn for detailed quality assurance and functionality testing. The course commenced on 14 September 2015, with 51,000 registered learners. The six-week version of MWPP ran seven times, attracting a total of 210,000 learners.

The most significant change to the course was made in 2017. The combination of high learner demand for additional mindfulness content and a shift by Monash and FutureLearn to MOOCs of a shorter duration (to maximise learner perseverance and course completion rates) saw MWPP shortened to four weeks. A second four-week course, *Maintaining a Mindful Life*, addressed learner demand for more advanced mindfulness content and techniques and ran for the first time in November 2017. To date, 151,000 learners have joined the four-week courses, and the change from one six-week course to two four-week courses has improved the rate of course completion, as illustrated below in Table 31.1.

With the plethora of MOOCs available to learners, the first key measure of course success is to convert enrolments in a course to active learners (as defined by FutureLearn as a learner who completes at least one learning step in the course). The conversion rate of the enrolled learner to active learner in these courses is close to

Table 31.1 Course enrolments, participation and completion rates from 2015–2019, by course

Course	Version	Joiners	Active learners	Fully participating learners	Active learners as a percentage of joiners (%)	Fully participating learners as a percentage of active learners (%)
Mindfulness for Wellbeing and Peak Performance	6-weeks	211,000	104,500	21,600	49.53	20.67
Mindfulness for Wellbeing and Peak Performance	4-weeks	93,000	46,600	11,500	50.11	24.68
Maintaining a Mindful Life	4-weeks	58,000	27,000	7,800	46.55	28.89
Totals		362,000	178,100	40,900	49.20	22.96

50%, well above the Monash MOOC average of 43%. The second key measure of success is then to convert Active Learners to Fully Participating Learners (as defined by FutureLearn as completing at least 90% of all learning steps within the course). In their four-week versions, close to 25% of active learners in Mindfulness for Wellbeing and Peak Performance and 30% of Maintaining a Mindful Life learners fully complete their course. Again, these results are above the Monash MOOC average of 23%.

31.3 Mentoring an Online Mindfulness Course—Dr. Sherelle Connaughton

31.3.1 Initial Impressions

Having previously taught mindfulness in only small, face-to-face settings, I confess I felt somewhat unsure when asked to be one of the first mentors for the online Mindfulness for Wellbeing and Peak Performance course on FutureLearn. Then when the first run commenced, with over 50,000 learners enrolled and thousands of comments posted in key steps, I seriously doubted how we could possibly attend to so many learners simultaneously.

However, it soon became apparent that learners can engage in a powerful and positive learning experience in this online setting (as detailed in the next section of this chapter) and I am constantly humbled by the deep gratitude and affirming feedback expressed by learners throughout each run. For although we cannot respond

to every learner individually, if fundamental questions and themes that the majority are contemplating are identified and addressed in an environment where learners feel heard, connected and supported, then we can meet many individual learning needs on a much larger scale than can be provided in a single traditional classroom.

31.3.2 The Mentor Role

Working alongside a fellow mentor, our primary role is to help facilitate the course by monitoring and contributing to the comments forum in each step.

Primary activities include:

- synthesising important points and providing tips to help learners navigate their way through the course and the FutureLearn platform, using a 'pinned comment' function that allows selected posts to remain at the top of a comments page;
- encouraging learners to explore the course articles, videos, audio and other exercises reflect on their learning and share their experiences by posting comments;
- normalising and validating learners' responses when practising mindfulness meditation and applying mindful principles in everyday life;
- supporting learners who express concerns about specific course content or their ability to put particular practices into action;
- documenting our interactions with notable learners who appear to be very vulnerable, resistant or challenged by parts of the course;
- highlighting important insights and interesting conversations by 'liking', responding to and sometimes 'pinning' individual learner posts;
- answering learner questions about the course content and supplementary materials, directing them toward further information when required;
- role modelling mindful communication and help create a supportive learning environment;
- redirecting learner discussions that drift off-topic or are based on incorrect information;
- intervening in disagreements or personal attacks (which are fortunately very rare);
- recording and flagging comments that breach the FutureLearn Code of Conduct (e.g., that contain self-promotion or offensive language) so these can be removed by a moderator;
- producing a weekly summary of popular topics and learner questions, that form the basis of the course educators' weekly feedback videos;
- sharing learner feedback about the course with the Monash team; and
- compiling a detailed report of recommendations to improve future runs of the course.

31.3.3 Mentoring Challenges

The most challenging aspect of mentoring an online course is choosing which comments to respond to, for it simply is not feasible in our part-time work hours to reply to every learner individually (and doing so would clutter up the comment forums and make them difficult to work through). Hence, it is important to select comments which are likely to resonate with a large number of learners and the mentors focus on posts that reflect common experiences and challenges with the practices, ask pertinent questions, share helpful supplementary reading, videos or audio exercises, offer support to someone who is experiencing difficulty, or celebrate a learner's success applying a new technique or insight.

Another noteworthy challenge is responding in a sufficiently detailed but intelligible way to an audience of international learners with varying levels of English proficiency, academic training and prior mindfulness study (spanning from those with no experience to those who teach their own mindfulness courses). Therefore, we endeavour to use clear, non-colloquial language, with as little jargon as possible, but also define key terms and provide links to additional material for those wanting to explore any topic further.

31.3.4 Other Key Lessons Learned

Being mindful that much information can be lost or misinterpreted in an online setting, the mentors are careful not to assume too much and to use phrases like "you might have noticed" or "it is commonly observed that" rather than suggesting we know what each learner is experiencing.

Knowing our replies to individual learners will be read by many, we are also wary of over-personalising comments and we preface specific advice by suggesting "anyone who is having difficulty with this might like to try" rather than implying a solution will work for any specific learner.

To streamline communication between the mentors during and between work shifts, we use online documents and spreadsheets to record the date and hours worked; steps covered; key topics and questions raised by learners in each step of the course; copies of pinned comments; details of flagged comments; observations about notable learners who might have expressed scepticism, mental health issues, technical difficulties or other challenges; and notes on what needs to be covered next. We also plan ahead who will be primarily responsible for which steps each week and who will take the lead on finalising the weekly summaries and different elements of the course feedback report.

31.3.5 Reflections and Recommendations

Overall, mentoring the course has been a very positive experience, and despite my initial doubts, I am confident that much can be gained from studying mindfulness online. I have also realised that offering mindfulness training in a free and flexible online format allows many learners who are unlikely to attend local classes to study these valuable practices—including those with limited free time or scarce financial resources, shift or on-call workers, parents of young children and others in caring roles, those with chronic physical or mental health conditions, those who feel unsure about their language proficiency or academic ability, and those living in isolated areas where few meditation classes are offered. Hence, providing high quality, online mindfulness courses can offer a beneficial learning experience to a vast array of people who might otherwise never access more traditional meditation training.

31.4 Participating in an Online Mindfulness Course—Alexandra Nance

When I chose to begin the online Mindfulness for Wellbeing and Peak Performance course, I had already been a student of mindfulness practice for around five years. Having just recently begun the rigorous journey of a Ph.D., and having a very irregular mindfulness practice at the time, I saw the online course as the perfect opportunity to re-establish a steady formal practice once again. That the course was free, online, and multiple weeks long were all factors that encouraged me to pursue it. At many times throughout my life, accessing quality mindfulness programmes was a luxury that I couldn't afford, so it was great to be offered a programme of such high calibre at no expense. At the time I started the course, I was on a remote island conducting fieldwork, so the online aspect allowed me to fully immerse myself in the programme despite where I was. Lastly, the course length reassured me that I would be able to re-establish everyday mindfulness and meditation as a healthy habit of self-care. These were my motivations for starting the course, but my motivations for continuing with and completing the course were very much generated from the way the course was designed and delivered.

Immediately upon beginning, I felt a strong sense of fluidity, personal and interpersonal connection, and a close sense of community; these impressions turned out to be pillars of the whole course. The flexibility of the course allowed me to reconnect with my internal self when I had the time and mental space to do so. The encouragement to interact with our mentors and the rest of the cohort under the course's community guidelines fostered a safe space for us all to share our experiences with each other. This not only allowed me to receive positive encouragement and advice from others, but also allowed me to deepen my own learning by giving encouragement and advice to those who were experiencing mental blocks familiar to me from my own experiences. I was pleasantly surprised by the personalised feedback provided

to the cohort by the educators at the end of every week. This extra effort made me feel heard, with my mindfulness struggles and those of my cohort legitimised and regarded with practical and helpful advice. Together, these aspects contributed to a meaningful and enjoyable learning experience.

Because of the extremely irregular nature of my schedule at the time I took this course, it was really important for me to be able to complete my learning in my own time and at my own pace. For this reason, the online format was ideal. The flexibility of the course made it possible for me to re-establish a regular mediation practice that has remained even a year later. Each week of learning was delivered in sections, making it extremely easy to portion out my daily learning as needed and keep my weekly learning on track. Beyond this, while we were encouraged by the educators and mentors to stay relatively in step with the course's weekly timeline, we still had the option to go through the course more slowly. This allowed me to shed the worries of time pressure and be present with each lesson, which optimised my capacity for sustainable learning and retention; I didn't need to rush through modules on auto-pilot in order to 'catch up'. We were also provided with diverse forms of media from which to learn (including in-course text, PDFs, audio and video, as well as links to news articles, academic articles, and external videos), which kept me engaged with and interested in the content. Despite being in the middle of a hectic field season, I managed to gain a lot from the course thanks to the dynamic delivery.

On top of fostering a fluid culture of learning, the course was also deeply interactive at multiple levels, made possible by having a cohort that started and ended the course together. In this way, I first interacted with the content, which was guided by additional information, feedback, and support from the skilled mentors. Our mentors answered any questions that arose from the content, helping us to venture deeper into mindfulness than what would have been possible alone. They also provided cohort-specific advice, pinning helpful supplementary information, as well as particularly insightful or helpful comments from other learners. This then flowed into a natural interaction with the other folks in my cohort, who hailed from many different countries and backgrounds. My learning was absolutely deepened through these interactions—the more I engaged with the mentors and learners, the more I understood the content on a fundamental level. Finally, as learners, we were also able to indirectly interact with the educators. After each week, the common questions, concerns and insights that came up within our cohort were addressed in an extended video by the educators. This brought a level of personalisation to the course that I had not experienced nor expected. Far from the feeling of isolation that many online courses can generate, I instead felt a strong sense of communal learning and mutual understanding.

My experience as a participant in the online course for mindfulness is distinctive from my experiences with other online courses. The flexibility of the course format cultivated a positive learning environment, enabling me to complete my learning on my own terms. The helpful content, delivered in multiple ways, incentivised me to keep coming back each day and week to learn more. The interaction—not only with other learners, but with the mentors and educators as well—made me excited to return to the forum for the next day's learning. All in all, I was able to deepen my

own understanding of mindfulness and regain a regular formal practice through this largely self-directed but excellently guided form of learning.

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Alexandra Nance is a Ph.D. student in conservation biology at Monash University, Melbourne, Australia and completed the Mindfulness for Wellbeing and Peak Performance (MWPP) MOOC course in 2018.

Dr. Richard Chambers is a Clinical Psychologist and leading expert in mindfulness and mindful education. Richard is leading a university-wide mindfulness initiative ay Monash University, Melbourne, Australia, embedding mindfulness in the core curriculum for students. Richard is lead educator, along with Associate Professor Craig Hassed, of two award-winning MOOCs—*Mindfulness for Wellbeing and Peak Performance* (MWPP) and *Maintaining a Mindful Life*—which were voted the top mindfulness MOOCs worldwide and in the top 30 MOOCs of all time, and have had almost 400,000 enrolments.

Associate Professor Craig Hassed is an Associate Professor at the Department of General Practice and the Mindfulness Coordinator at Monash University, Melbourne, Australia and is an internationally recognised expert in mindfulness and mindfulness education. Craig is lead educator, along with Dr. Richard Chambers, of two award-winning MOOCs—*Mindfulness for Wellbeing and Peak Performance* (MWPP) and *Maintaining a Mindful Life*—which were voted the top mindfulness MOOCs worldwide and in the top 30 MOOCs of all time, and have had almost 400,000 enrolments.

Chapter 32
Reflections on the Design and Delivery of Online Corporate Training

Vicky Charalambous and Charalambos Vrasidas

Abstract Corporate training in Cyprus has been traditionally delivered exclusively via face-to-face sessions. During the COVID-19 pandemic, a large part of online training was implemented online. Indeed, the pandemic has accelerated several transformations of the education sector, including professional development. Our team at the Institute of Development has been offering trainings and seminars to business and industry for the last 20 years. One of the areas we have been designing and delivering training is on performance management. In this brief reflection chapter, we will share our experiences on adapting a face-to-face training program for full online synchronous delivery. We begin with a brief description of the context, course and target groups. We then reflect on some of the key challenges and opportunities we see in adapting traditional face-to-face sessions online. We close the chapter by offering practical tips based on our experiences in designing and delivering the course.

32.1 Description of Context

Good performance management is an important characteristic of successful organizations. Training on such issues usually includes establishing clear goals and SMART objectives, defining key metrics and KPIs, developing appropriate mechanisms for feedback, coaching, and evaluation. Providing training to management teams on these processes should also provide opportunities to understand the key concepts, view case studies and scenarios, engage in practice and role play, provide feedback, and coach their teams. This training was developed and delivered by the first author (VC from the Institute of Development) to the largest non-profit in Cyprus (CARDET).

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CARDET is the largest independent non-profit in the eastern Mediterranean region, with core expertise in online education and digital learning. The centre's team has completed numerous projects relating to virtual schooling, digital literacies, online education, and MOOCs. Online education projects were implemented in more than 30 countries, several of which were supported by the European Commission, the United Nations Development Program, Microsoft, The Commonwealth of Learning, international agencies and governments around the world. The main training objective was to build the skills and competences of managers to design and implement appropriate performance management systems in their organization. The training was offered to the senior management team of CARDET (10 managers). The trainees were individuals of the CARDET management team (line managers) who will both be evaluated themselves and will have the role of evaluator, so it was important to be fully prepared to understand and manage the new performance evaluation and goal setting system adopted by CARDET. The managers were engaged in the restructuring of the organization and establishing a solid performance management system. The majority of them are experts in online teaching and learning, since it is the primary focus of the organization. Therefore, there was no real need to prepare them for the online course. The duration of the training was 14 h delivered within a week, offered over a period of four days (3.5 h per day excluding breaks). The platform used for delivery was ZOOM, which allowed for synchronous delivery, breakout rooms, and integration of other tools such as polls and screen sharing.

The training agenda included:

- Performance management planning, detailed explanation of the company's competency framework, and practice in writing SMART objectives
- Monitoring performance, identifying critical incidents, stimulating employee motivation and engagement.
- Handling poor performance and giving constructive feedback, coaching skills, introduction to the GROW model, and practice in coaching skills
- Preparing for the appraisal interview, handling disagreements with difficult employees, and building appraiser skills.

Examples of activities used included: brief 15 min presentations of key issues by the trainer, short 5–7 videos with examples and case studies, quick quizzes and learning competitions using KAHOOT, polls, teamwork in breakout rooms with reporting back to the whole class, role play using case studies, and brief reflections sessions at the end of each day. For example, one of the activities included the role-playing of case studies of employees of varying levels of performance and the practicing of giving feedback, in breakout rooms. During this activity, participants could experience what it means to be the appraiser, appraisee, and observer.

32.2 Challenges and Opportunities

The biggest challenge was that we had to offer the training only in a synchronous mode, in order to comply with the local Cyprus Human Development Authority and qualify for the government subsidize for the costs of the training. We could not provide for asynchronous activities and engagement of learners at their own pace and time. This limited the kinds of activities = we could design and implement. It can be very tiring for groups to be online synchronously for long periods of time. One of the key advantages of online delivery is the flexibility. Hence, requiring all participants to engage in a synchronous mode was not the best approach. In order to address this, we developed several activities and frequent breaks to allow for participants to interact, engage and get the most out of the learning experience.

Another challenge had to do with the lack of physical presence for coaching sessions and role-play during which a team leader would conduct performance evaluation, provide feedback and coach a member of the team. Although live video conferencing is a good alternative, the immediacy of interaction in physical presence in dealing with issues of performance management, is important. During the debriefing session at the end of the training, one of the managers stated that during role-play, although live conferencing worked well, the immediacy of interaction during face-to-face meetings supports the communication and discussion better, particularly when dealing with controversial issues. For example, when a manager has to give negative feedback and then coach a team member, this is easier to do in face-to-face settings.

Furthermore, in a face-to-face setting, it is difficult for trainees to disengage when a good trainer is leading the program. Online, it is difficult for the trainer to monitor all learners and ensure they are engaged and not distracted by their social media posts and newsfeeds. Regardless of these challenges, overall the participants appreciated the frequent opportunities for live interaction, discussion, and role-play.

On the other hand, online delivery offers tremendous opportunities for the ongoing professional development of teams. The flexibility offered that allows team members from all around Cyprus to join online without the need to leave their home as very valuable, particularly for those who had children at home and during the pandemic they could not leave them unattended. Furthermore, being able to record the training session and all activities allows managers to review all discussions and exercises again, and reflect on their own role-play performance.

Another aspect that worked well, was that the large majority of training methods that were initially designed for face-to-face settings were easily adapted and used in the online synchronous training. Participants appreciated the fact that they could connect online during the lockdown (because of COVID-19), from the safety of their homes. The practical, hands-on aspects of the training, during which learners used role-play to practice coaching and giving feedback using case study scenarios, where the parts that learners enjoyed the most. Some of the case study videos were a bit too long but, overall, the group's engagement was high. During a training evaluation, 90% of the participants indicated the training fully achieved its objectives.

32.3 Recommendations and Reflections

Reflecting on the implementation and listening to the feedback from participants, the training was successful, considering the trainer of the seminar (lead author) had extensive experience in traditional face-to-face corporate training, but limited experience in online training. The second author (CV) who has extensive expertise in online education supported the process. He designed his first online course in 1996, using the system First Class, and in 2000, he led a team that designed a full online Master's Degree and a Virtual High School. As the leader of the CARDET team, he worked closely with the trainers and first author to design and adapt the training for synchronous online delivery. Below we offer some basic practical tips and recommendations based on what we learned:

- Choose the right technology tools that are simple to use, reliable and appropriate for your target audience. In our case, we used ZOOM and, in some cases, KAHOOT for online polls, and gamification of the user experience. The use of gamification increased engagement, and at the end of each session, there was a small fun competition among participants to measure and provide feedback on knowledge acquisition.
- Design specifically for online collaboration and require participants to work in groups to discuss and contribute to the issues of the course. Participation in the online discussions, chat rooms, message boards, breakout rooms, and role play needs to be carefully planned with all criteria and processes communicated to the participants. The instructor needs to ensure that online training sessions encourage interaction and inclusivity.
- When choosing group members and forming teams, pair expert learners with less experienced learners to collaborate in the group sessions. This is particularly challenging online, given the varying technology expertise of some of the team members.
- Use polls as a means to give opportunities to learners to engage and contribute to the discussions, interact, reflect, and even evaluate their knowledge. Polls are very good for individuals to compare themselves to others, to gain feedback on knowledge or understanding, and to set norms. They often substitute for some face-to-face equivalents, such as gaining consensus from the group with a show of hands, etc.
- The share screen function needs to be tested well, and the resolution of graphics and quality of videos and sound need to be carefully selected. In a couple of occasions when the videos used were of high quality, because of low bandwidth from some of the participants, the quality of playback was poor.
- Engaging synchronously for extended periods is a challenge for both the trainer and the learners. Use creative energisers/icebreakers that can be done remotely and synchronously.
- Break the training into brief sessions, not longer than one hour with at least 10–15 min breaks. Being online for long periods can be tiring for the learner and trainers. Embedding short videos in the training adds variety to the content, and is

a quick way to present a topic, explain a process, or present some expert opinion on the topics of the course.

- The facilitator skills are critical for the success of synchronous online discussions. The trainer should utilize a variety of group management strategies and digital tools that promote the development of a safe, learner-centered environment, group cohesion, and comfort with risk taking (such as role-playing, and commitment to common learning objectives).
- Share simple tutorials and video demos of the tools to be used to help learners get up to speed. In our case, we shared some simple tips and videos on how to engage with ZOOM and how to participate in the break out rooms, and online polls.
- Interchange between a variety of activities to keep learners engaged. For example, we used simple 10-min presentations, followed by a group discussion in break out rooms, and then the whole class together reflection. We tried to keep the talking of the trainer to a minimum to allow for participants to engage in group discussions and activities.

32.4 Conclusion

In this brief case study, we share our experience of adapting a traditionally face-to-face corporate training course for synchronous online delivery. It was obvious from the feedback that online training is not inferior compared with face-to-face. If designed properly with the learner in mind, it can have similar results, and at times better, at least in terms of participant satisfaction. Given the collective experience of the authors, it was a fruitful collaboration with many lessons to be learned. Readers should compare their own setting and adopt the tips and recommendations in ways that best match their needs. Online education has a powerful and huge potential. The pandemic has accelerated the adoption of online education and in many contexts around the world, and this transformation is here to stay.

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Chapter 33
Advancing Online Education Through a Community of Practice

Geoff Rose, Stephen McKenzie, Christopher J. Holt, Filia Garivaldis, and Matthew Mundy

Abstract In universities that are expanding their presence in online education, there can be opportunities to harness the experience of staff from a range of faculties to develop staff capacity and enhance student learning experiences. A collaborative cross-faculty approach at Monash University has led to the development of the Monash Online Education Community of Practice (MOEC). This chapter outlines the process used to engage staff and build the community through a series of events and initiatives which culminated in the launch of MOEC and the development of a portal to support interaction and ongoing MOEC activities. As a tangible demonstration of the cross-faculty collaboration built through MOEC, members developed a new online learning hub which will provide an enhanced orientation experience for students studying online at Monash University. Opportunities exist to enhance understanding of the impacts of this and other communities of practice initiatives at the levels of the individual, the community and the organisation.

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33.1 Introduction

A Community of Practice (CoP) refers to a group of people who interact on an ongoing basis by engaging and sharing concerns to deepen their knowledge and expertise in common practices (Wenger et al. 2002). While their composition, purpose and methods of interaction vary (Li et al. 2009; Ranmuthugala et al. 2011), a CoP encourages formal and informal learning in a workplace (Steinert 2014), and is often viewed as having four essential functions: social interaction, knowledge-sharing, knowledge-creation and identity-building (Li et al. 2009).

By promoting collaboration and improving social interaction there is scope for increased productivity and improved organisational performance (Clare and Detore 2000; Lesser and Strock 2001). A CoP has the potential to deliver benefits at the level of the individual, the community and the organization (Millen et al. 2002), by encouraging member interaction, contributing to professional development and providing an avenue for learning about new tools, methods and approaches (Millen et al. 2002).

A CoP may be established to focus on a particular discipline (for example health care or marketing) or its focus may be inherently cross-disciplinary in nature, like the one described here. The focus here is on a CoP established with a focus on online education that brought together staff from a range of faculties. Starting from informal interaction between staff who shared a passion for online education, a process of engaging with the broader university community resulted in the formation of a CoP to support and stimulate ongoing interaction.

This chapter begins by outlining the development of the CoP with emphasis on the targeted initiatives designed to engage staff and build the critical mass needed to support and formalise the CoP. Based on the strength of support for the CoP, a working group developed a framework for the CoP and a portal was developed as a depository for outputs from activities and as a means of communication and engagement with the members. The scope of the portal used to underpin its activities is described later. The chapter then considers a tangible example of the impact of the collaboration generated through the CoP, which took the form of developing an online learning hub designed to provide an enhanced orientation experience for students studying online at Monash University. The final section of the chapter highlights conclusions, reflections and recommendations.

33.2 Engagement and Community Building

The process of engaging the academic community and building the CoP was a multi-year undertaking which began in 2017. While it started as a bottom-up initiative, early steps were taken to engage with the University administration and in time, make the case for university level strategic support for the initiative.

The initial collaboration grew out of informal interaction by staff across three faculties (Psychology, Education and Engineering) who were engaged in the delivery of online education programmes and shared common perceptions that stronger and wider collaboration could expand the evidence base for online education and strengthen practice. That core group put forward a proposal for an interactive workshop as part of an annual university wide Learning and Teaching Conference held in 2017. The workshop session was designed to explore the challenges and opportunities associated with teaching and learning in an off-campus mode and gauge interest in the establishment of a Community of Practice focussed on off-campus learning.

Conference participants were asked to nominate to take part in the workshop, as for other workshops at the conference, and it was run in a flipped learning delivery mode designed to draw on some of the elements of online education. Prior to attending the workshop, participants were asked to complete three items of pre-work:

1. View an introductory video clip about the workshop prepared by three of the workshop organisers, which outlined the purpose of the workshop and its structure,
2. Hear from a student via an audio recording who described her experience with off-campus learning, and
3. Spend a few minutes to consider their responses to three questions which framed the group discussion sessions in the workshop:

    - How would you summarise your current involvement, or interest, in off-campus learning and teaching?
    - What do you see as the challenges and opportunities associated with off-campus learning and teaching?
    - What do you want to know more about to enhance your practice in relation to off-campus learning and teaching?

In the workshop participants were allocated to tables with the intent of achieving a mix of disciplines. Following round table introductions where participants were invited to outline their current involvement, or interest in off-campus learning and teaching, the workshop time was then spent with the participants working in their groups to summarise their responses to the two other prompt questions. The workshop organisers then used a nominal group technique to consolidate those responses across groups.

In terms of the challenges associated with off-campus learning, two key themes emerged as common concerns: (1) Enhancing student interaction and (2) accommodating different learning preferences. A key concern was the risk of students feeling isolated through a lack of human contact and interaction and the need to tackle negative consequences of this physical segregation. There was a strong desire to foster a ‘Community Experience’ for online/off-campus students while highlighting that there are challenges associated with students who do not wish to interact, often for a variety of reasons associated with pressures of part-time study when combined with work and family responsibilities. Student well-being was highlighted as a critical

consideration not only for health impacts but also because of its link to academic performance.

There was also a major theme around learning challenges particularly for how off-campus learning modules could account for synchronous versus asynchronous learning and what level of synchronous peer-to-peer and/or instructor/lecturer contact was desirable to stimulate and support student learning. Differences in learning needs and response times were noted, as well as challenges associated with infrastructure/technological reliability and different levels of technological capabilities among learners.

Despite those and other challenges, participants were optimistic about the opportunities presented by off-campus learning. Participants saw scope to encourage a sense of community which would allow students to develop relevant 'soft skills' associated with collaboration, teamwork and self-management. There was also scope to make effective use of online forums to engage students and encourage them to stop and reflect on others' contributions. Online learning platforms were perceived to offer 24/7 flexibility for learners with other commitments (work, family, etc.) and while there was diversity in technological literacy across both staff and students, the level of literacy was improving over time and new tools were emerging to engage students more effectively in collaborative activities.

Participants saw a clear value in continuing the interaction about online education. The concept of developing a CoP was raised and strongly supported. Apart from internal collaboration, participants saw scope to engage with other Universities and thereby to potentially extend the CoP to other institutions. There was a strong desire to have special interest groups and/or working groups which would encourage members to share goals, actions and examples of good practice, as well as examples/case studies of how people in different disciplines use technology in the online/distance education space. Participants also saw value in sharing experiences of what works and what doesn't work, as well as to share information on resources which were available. A Newsletter, online discussion board and/or a blog were seen as opportunities for dissemination of information and updates and participants saw the potential for the group to undertake peer mentoring/consultations/support to provide feedback on current practice.

There was a strong view among participants that it was critical that the CoP be connected to the University's Office of Learning and Teaching and seen to be leading the digital strategy at Monash to provide an avenue for feeding ideas from the 'ground up' to influence Monash strategy. There was also a strong view that the CoP needed to have integrated student's voices. This could be achieved by networking with relevant student bodies or by leveraging the experiences of students who are proactively balancing online study with professional practice in industry and 'real lives' the home front.

A range of key topics were identified which could be covered via future events such as breakfast meetings with a panel of speakers or presentations and mini symposia, etc. Topics highlighted for further exploration included existing Monash projects and success stories; quality standards for online learning; managing large groups online and the impact of course design on the off-campus learning experience.

There was a very strong sense that the CoP should also support relevant research related to online/distance learning and teaching by disseminating research findings and helping/supporting teams to secure funding for collaborative research to strengthen programme design and delivery through evidence-based innovations.

Reflecting on the experience from that initial workshop, the organisers felt there was a critical mass of staff from across the university with the interest and enthusiasm to create an active CoP. Using the feedback about priority topics and issues, the organisers had follow up discussions with the Office of Learning and Teaching and began planning to establish a CoP focussed on online education.

33.3 Launch of the Monash Online Education Community of Practice

In 2018, a cross-faculty working group, inspired by a core team from the Monash School of Psychological Sciences, planned the launch of the Monash Online Education Community of Practice (MOEC). The University Office of Learning and Teaching provided strategic support for the initiative. Reflecting a desire stated at the initial workshop, external collaboration was regarded as critical and the concept and scope of MOEC was further developed through discussion with academic staff and King's College London as part of a cross university Digital Education Workshop held in early 2018.

MOEC was officially launched in July 2018, with the keynote speaker being the Senior Pro Vice-Chancellor (Academic), Professor Zlatko Zkrbis. Prior to the MOEC Launch, a pre-launch survey was distributed to all invitees. The results of this survey indicated that the three key priorities to MOEC members regarding online education, were education quality, student engagement and training in new technologies. During the brainstorming session held as part of the MOEC launch, round table discussions explored challenges and opportunities in each of those three priority areas and sounded out participant interest in forming a special interest group for each of those three topics.

MOEC now consists of members from across the university including Psychology, Public Health, Engineering, Education, IT and the Library. The aim of the group is to consolidate, strengthen and grow our collective capacity to deliver courses in an online mode and to enable the wider university community to benefit. This activity is timely, given the strategic priority set by the university for courses across the university to consider digital education as a way to achieve continued growth. Over the last five years, substantial knowledge and expertise in online teaching and learning had been developed in different parts of the university, and now MOEC provides the mechanism by which this information can be shared across the university. This is being achieved by consolidating knowledge and innovation among the group, and building a virtual library of reference material on best practice in online education, along with a repository of examples and teaching artefacts. Critically, this endeavour

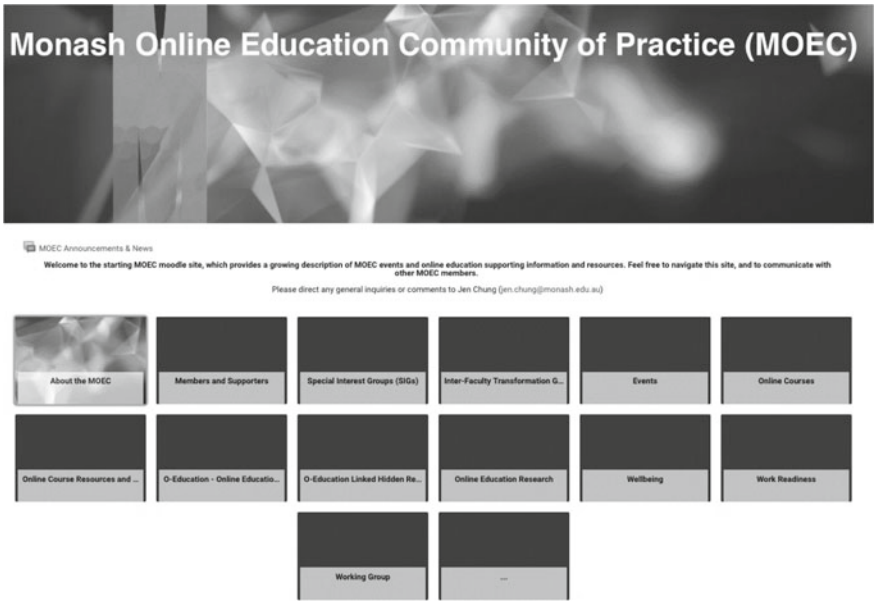

Fig. 33.1 Monash Online Education Community of Practice (MOEC) Moodle site

is being evidence-driven and supported by strong educational research, to document and disseminate this knowledge on the international stage.

The ongoing work of MOEC is accessible via the MOEC portal, developed soon after the MOEC launch. The portal resides in Moodle, the learning management system used by the University. As shown in Fig. 33.1, the Moodle site provides background on MOEC, a record of MOEC events, links to the three special interest groups (Training in New Technologies, Student Engagement and Education Quality), resources for academic staff, as well as a link to ongoing research activities.

After the launch, further MOEC events followed to continue to engage CoP members. A workshop in October 2018, explored the scope for co-design of a range of continuing professional development modules which would support academic staff to develop confidence and skills in delivering online education. The focus in 2019, turned to online education research and that was the focus of a mini-symposium held in February 2019. It included presentations from the international collaborators in online education and in MOEC, King's College London, an overview of MOPED (Monash Online Psychology Education Division) research activity relating to online education and presentations from academic staff in other faculties engaged in research about online education. Time was also devoted to exploring funding opportunities to support online education research. The themes explored at this symposium reflected the priority areas identified at the first workshop held in 2017. An important function of the event was to provide an opportunity for networking among academics engaged in, or interested in undertaking, research into online education. That built

momentum for undertaking a broad collaborative research project, the preparation for which became a focus in the latter part of 2018.

33.4 Monash Online Learning Hub: A Tangible Example of CoP Collaboration

A core group of MOEC members, led through the Monash School of Psychological Sciences, were successful in securing funding through an internal University grant scheme targeting interfaculty transformations in education. Awarded annually by the Monash Education Academy (MEA), this grant scheme supports and champions projects that have the capacity to result in an impactful change in education across more than one Faculty. Reflecting on the priorities raised in an early MOEC workshop, a key component of the project was to provide support for students beginning online study at Monash.

The project involved the development of an online learning hub comprising resources and tools that provide student-centered educational support, in one integrated site, for all of the University's students studying online. The site houses links to existing online Monash facilities and resources, as well as new resources, specifically tailored to online students. These resources were designed to help orient students into online study and the University's online services, support them academically for the duration of their study, as well as equip them with skills for life after study. In addition, to consolidate the existing information that is currently offered via a variety of platforms, it has extended this with new and innovative content such as online student well-being and learning resources relating to work readiness, employability and resilience. With the new site in place, Schools and Departments within Monash will not need to create their own resources to support online student orientation, and as such, students will be provided with a consistent and high quality educational experience.

Reflecting the earlier initiatives through MOEC the development of the site was very much a collaborative initiative drawing broadly on the academic community at Monash. The site development drew heavily on input from two brainstorming needs workshops held in the first half of 2019. Results from a baseline analysis highlighted substantial variation in the orientation material available for online students across faculties, unearthed some valuable resources of relevance to the site and identified some obvious areas where new resources were required. The subsequent discussion in the workshops was structured around addressing how the resources identified as being needed could be developed, and made available to students, as well as potential structures for the online resource.

Working groups from the project team and MOEC then developed individual components, with the overall site designed and produced by an educational designer recruited to support the research project. A three-part review of the site was undertaken as part of the development in the latter part of 2019. First, there was an internal

working group review once the full prototype was available, then a MOEC review workshop and finally a student review. Refinement of the site took place after each of those reviews.

The contents of the Monash OnLine Learning Hub (MOLH) are highlighted in the navigation bar shown in Fig. 33.2. The site provides a welcome to students studying online to distinguish this site from the common focus of other university orientation

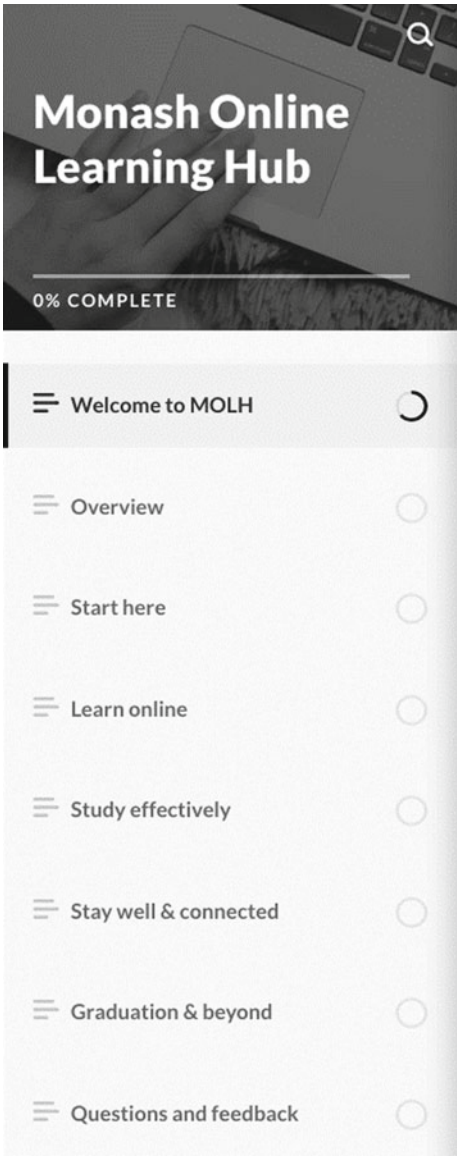

Fig. 33.2 Navigation bar of Monash Online Learning Hub

material which is pitched at students studying on-campus. The site links to material available on the University web site for details of the Monash Student Charter, information about key dates and fee assistance. It provides links to the learning management system (Moodle) and to the social network for new Monash Students. Material is included about tips for online learning, effective study skills, well-being (both physical and mental including a mindfulness minicourse with practice exercises) and advice about where to turn for help if it is needed. The final section provides information about graduation and career planning resources to round off the site and ensure that it provides value to students beyond when they start at the university.

The site will be rolled out to students in a test group of academic programmes, and feedback from that pilot test will enable final refinements to the site prior to university wide release. As part of the roll out, a commitment is being made to collect data to provide insight into the usage of the site and the extent to which it meets student needs. That research dimension, designed to advance the scholarship of learning and teaching, is an important aspect of a project like this undertaken in a research-intensive institution.

33.5 Conclusion, Reflections and Recommendations

Considerable momentum has been built from a multi-year process pursued to engage staff and form a community of practice to advance online education at Monash University. The activities on the CoP have gone beyond providing a forum for networking and information sharing, to developing resources designed to enhance learning outcomes for students. The collaborative effort that resulted in the online learning hub (MOLH) was also grounded in a desire to advance the scholarship of learning and teaching by including an explicit research dimension in the process.

Taking time to engage and build shared commitment of staff is regarded as critical to the success of the initiative described here. While there has been a strong 'bottom-up' emphasis in developing the CoP, we believe that early engagement with University management, through the Office of Learning and Teaching, and an explicit focus on aligning the initiative with a key university strategic priority, have helped to secure strategic support for the initiative.

Initiatives of this nature require considerable staff commitment over an extended period of time to ensure the continuity of the initiative. As staffing changes occur over time, renewal of the key leadership team will be critical to the CoP continuing to make a contribution.

Based on the MOEC journey to date, our recommendation would be that other groups looking to establish a CoP take the time to build the engagement before advancing to the next step of a more formal arrangement. We also believe that there is much to be learned from ongoing research in this space. A key issue in that regard is understanding the impact that these CoP have not only on individual performance and team effectiveness, but also on overall productivity (Millen et al. 2002), and organizational impact.

Wenger et al.'s (2002) seminal framework for assessing value creation in a CoP would be a useful starting point when undertaking a value assessment for MOEC or similar CoP initiatives. However, as Lum et al. (2009), noted in their systematic literature review of CoP in the health sector, none of the reported studies in the literature included a control group. While the lack of control is a shortcoming with evaluation studies, it is not clear that it can be readily overcome in future study designs without extensive research to control for differences within and between CoPs working in different domains. Millen et al. (2002) noted that measuring and demonstrating the value of a CoP is difficult, and while that continues to be the case today, the considerable investment in staff time which is required to underpin these initiatives requires that adequate attention be directed at the return on that investment. In a university setting, the long-term value of CoP like this will centre on its contribution to student learning, and at least in the case of research-intensive universities, the extent to which initiatives of this nature contribute the advancement on knowledge in relation to online education.

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Epilogue: How Can We Best Prepare for Our Brave New Education World? New Directions and Vehicles

Stephen McKenzie and Filia Garivaldis

Abstract Great problems require and allow great solutions. A great problem currently facing tertiary education is that there is not enough of it to go around. Rapidly increasing numbers of students, including in developing countries, are creating traditional education bottlenecks—caused by limitations of physical space and other physical teaching resources. This online education supply problem and related opportunities for the development of a new generation of online education courses have recently been accentuated, by the rapidly increased demand for online versions of existing non-online courses and the development of new online courses in response to the Covid-19 pandemic. Another great problem facing tertiary education is its increasing emphasis on the development of courses that need to meet specific learning objectives, including vocation specific learning objectives, and a decreasing emphasis on courses that meet general learning objectives, including transferable skills and deep learning. We are increasingly teaching students what to think rather than how to think. A rapid expansion of online education is needed for education to fully meet its new needs and to move freely beyond its traditional format limitations. This expansion needs to not only respond to a need for more all education and online education access, but respond to a rapidly increasing need for *high quality* education access. There are potential problems underlying our rapid online education expansion that need to be identified and met before they can be transformed into great online education solutions. This epilogue chapter explores where online education needs to go and what it needs to help it get there.

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Online Education Directions

Whence come you, and whither are you going?
Plato/ Socrates, *The Phaedrus*

The rapid expansion of online teaching and learning that is now required to reduce education access limitations caused by a rapidly increasing number of students and the rapid increase in demand for online education solutions including as a result of the COVID-19 pandemic has made online education our brave new education frontier. The time has come for us to seize this great new opportunity to respond to new needs also to take education has a whole further than it has ever been. Online education is inherently exciting because it is relatively new and dynamic and not yet fully explored. A good place to start directing a systematic exploration of this world of opportunities is with a vision, of where we want to be, to help us work out the best ways of getting there. An optimal online education vision statement to drive optimal online education research, development and implementation includes key current online education objectives, such as:

– Expanding education opportunities including students in isolated geographic locations or with other potential education access barriers,
– Reducing the cost and therefore increasing the financial viability and reach of education.

An optimal online vision statement should also include key second-generation education objectives, which have been explored in this book, such as:

– Providing real educational equivalence to traditional education, including whole student experience equivalence,
– Providing a quality learning environment that offers new education opportunities via the use of integrated new technologies, and re-visited education opportunities via the use of deep and deeply satisfying learning processes and outcomes.

We are at the end of our online education honeymoon and are moving into the next phase of this coming ready or not education paradigm shift, which offers us even greater challenges than we faced in our getting to know you and know how to live with your phase. We now need to take our relationship with online education to a deeper, more challenging and potentially more rewarding level, and find out where we can really go together.

Now is the time when we can end our winter of education discontent and begin a great new education season, and now is the time when we can stop going along for the online education ride and start driving it hard and responsibly, to its brave and best new destination. We can start the next phase of our online education journey by asking ourselves and others what the online education genie is really offering us, where it is really taking us, and how we can best use its driving force.

Online Education Vehicles

The evolution of all things, species and education systems is a history of failures, as well as of successes. It is useful to learn lessons from our failure, as well as from our successes, to help us learn what will help make online education species fit to survive and thrive. Rovai and Downey (2010) listed seven factors that are important for online course success:

- Planning
- Marketing and recruitment
- Financial management
- Quality assurance
- Student retention
- Faculty development
- Online course design and pedagogy.

Sun and Chen (2016) provide three criteria for the optimal advancement of the seventh factor—Online course design and pedagogy—which have been valuably advanced in this book:

- Well-designed course content, motivating interaction between the instructor and learners, well-prepared and fully-supported instructors
- Creation of a sense of online learning community
- Rapid advancement of technology.

In order to optimally meet these criteria, we believe that it is becoming increasingly necessary to consciously develop and choose online education vehicles—models—that will help us strategically navigate towards our optimal online education destinations. Human knowledge progresses best when we use an underlying model to help us understand where we have come from, where we are and where we are going. When we look at these models deeply and dispassionately we can see a deep predictive power in them that is deeper than the belief that one model must be right, and therefore, the other model must be wrong.

Developing and deeply understanding models allows us to choose the model that best suits our needs, or choose features of models that will best suit our needs. An example of this process is choosing either qualitative or quantitative analyses depending on our particular analysis needs, without needing to say that one model is true and that the other one is false. We can even adopt a mixed model design where we use the best of both model worlds. The growth of online education has enabled opportunities for additional models of education to be explored and re-explored, including the pre-online education historical precedent. It doesn't matter whether the model that we develop and use is right or wrong, it matters that it helps us to consider and to choose. This choice will depend on our particular online education desires and needs, and whether we are an online student, teacher, developer or planner.

Random Growth (Weed) Versus Cultivated Growth (Rose) Models

As with most things, online education development and also online experience can just happen or it can be carefully planned. Advantages of things just happening include spontaneity, flexibility and raw opportunistic energy. When there is no attachment to a particular way of doing things they can be done anyway, potentially including the best way. Alternatively, the advantages of things being helped to happen include that they can happen based on purposeful and sustainable reasons, including research evidence that supports best practice. A comparative example of online development and implementation being done without a plan and with a plan is either basing online development and teaching practice on the unquestioned acceptance of online education orthodoxies, or basing it on online best practice research or systematic experience-based learning.

When two of the editors of this book (SM & FG) started to develop and implement their new online fourth-year psychology course in 2015, online teaching features such as video length and a number of questions in online quizzes tended to be more often based on online orthodoxy, or habit, than on research evidence, or systematic learnings from relevant experience. Our use of analytics to inform course refinement and creation of an online education research programme was a small step in the same direction—of challenges to orthodoxy—as the great leaps forward by historic paradigm shifters. Christopher Columbus, for example, acquired strong empirical evidence (consisting of his not sailing his ship off the end of a flat earth) supporting the round world hypothesis. Maybe the best online development, teaching and learning model is a combination of random and planned models which allow for a creative combination of spontaneity, flexibility and reason.

Spartan Versus Athenian Models

Sparta was a great ancient Greek city state. The ancient Spartans successfully created a lean and mean fighting machine because they were driven—by a deep desire to be the greatest—*military* power. The Spartans left their very young children exposed naked overnight to naked nature, to test the hypothesis that only the strong would and should survive. The ancient Spartans separated boys and men from the rest of the city so that they would grow up to be focused fighters, ready and able to successfully make war on whoever was less ready for it than they were.

Athens was another great ancient Greek city state. The ancient Athenians created a holistic and humanistic society that included the invention and popular practice of democracy, the rule of the people and the invention and practice of ancient Greek philosophy, the love of wisdom. As well as giving us the Plato and Socrates double

philosophical act they gave us great historians and playwrights. The ancient Athenians did all that and more because they were driven—by a deep desire to be the greatest—*knowing* power.

The Spartan online education model is pragmatically focused—on attracting a lot of students, making a lot of money and giving the department that offers the course a reputation for being a centre of online education excellence. To achieve their aims these courses could employ junior and obedient staff who are encouraged to contribute to the streamlining of processes and efficiencies, and develop minimalist course materials for dissemination in their online Learning Management System.

The Athenian online education model is broadly focused—including on striving to keep its students happy and fulfilled, keep its staff happy and fulfilled and give the department that offers the course a reputation for being a centre of broad online education excellence. To achieve its aim, these courses could take a relatively long time to develop online education innovations, employ junior yet strong-willed teaching staff who are encouraged to deeply contribute to the emerging essence of the course, develop evolving teaching materials that are based on what online education could do, rather than on what it had done.

The Spartan versus Athenian online education models may appear to be two competing philosophies and systems. Perhaps like most adversaries these apparently competing systems can successfully learn from and influence each other. The optimal online education model may be what could be called a happy median or middle path online model, that follows a middle path between Spartan and Athenian excesses! This model could also achieve a middle path between Scylla and Cerberus (the devil and the great blue sea) and between Random Growth and Planned Growth excesses. A middle path can also be achieved between on campus and online opportunities.

What Next?

So where are we really coming from and where are we really going with our rapidly expanding responses to the rapidly expanding need for an expansion of online education, and an optimisation of the total online education experience?

This book is a bridge between what has already happened, what is now happening and what will happen next in online education. Part 1 provided theoretical and practical knowledge relating to current, emerging and future online education innovations and advances. Together these will help the systematic development and implementation of a new and necessary online education generation, that can exceed, as well as meet traditional education equivalence. Part 2 provided ways for this new online education generation to optimally meet vital student needs including for total online education success. This includes an optimal sense of education community, well-being and employability, as well as total academic success. Part 3 provided pioneering examples of online education that can help inspire, as well as inform online education students, teachers, developers and administrators, and help them make the best use that they possibly can of our great new education opportunity.

Online education comes from, lives in and will live in the same place that any education comes from—a place of knowing, a place of wanting to know, a place of sharing, a place of growing. Online education could, if we forget where it really came from and where it is really going, end up meeting the needs of only one—institution, or course, or individual online citizen—as opposed to meeting the needs of All—institutions, courses and individual online citizens.

With the vastly increasing demand for online education, we need to be careful to ensure that its growth isn't only driven by a desire for a competitive commercial edge, or a desire to expand without guiding principles or plans. There is a chess teaching principle that can be usefully applied to any teaching situation, including the optimal development of an online education paradigm—*a bad plan is better than no plan!* Ideally, when we plan our online education evolution we will start with a good plan, however, if we remain open to opportunities we can eventually turn a bad plan into a good plan, and a plan that best suits our own situation. Whether you have just arrived in the online education world, or whether you are looking for where to travel in it next, we hope that this book has provided valuable online education perspectives and resources that will guide you in your online education adventure and beyond.

> *We shall not cease from exploration, and the end of all our exploring will be to arrive where we started and know the place for the first time.*
>
> T. S. Eliot

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