



COMMONWEALTH of LEARNING

Participant Experience in an Inquiry-Based Massive Open Online Course

Nathaniel Ostashewski and Martha Cleveland-Innes

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Participant Experience in an Inquiry-Based Massive Open Online Course

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Foreword

As an intergovernmental organisation, the Commonwealth of Learning leverages the power of information and communication technologies to increase access to and improve the quality of education and training in Commonwealth countries. One strategy for scaling professional development is to harness the potential of massive open online courses (MOOCs). A MOOC titled Introduction to Technology-Enabled Learning (TEL), developed and offered in collaboration with Athabasca University, Canada, has built the capacity of over 18,000 participants in the last five years. This course became even more relevant during the Covid-19 pandemic, when teachers had to transition practically overnight to online learning.

TELMOOC provides a rich, interactive learning environment for teachers at all levels. Based on the Community of Inquiry model, the design of TELMOOC combines the best features of xMOOCs and cMOOCs. While videos, reading materials, quizzes, discussion forums, and assignments are used, as in all MOOC offerings, the TELMOOC also provides robust learner support to improve engagement and motivation. Another distinctive feature has been regular participant feedback, which has contributed to continuous improvement of the MOOC.

Data collected over the last five years form the basis of *Participant Experience in an Inquiry-Based Massive Open Online Course*. This book offers valuable insights into the design and development of MOOCs for professional capacity building. One insight relates to providing a framework for developing and delivering successful MOOCs, which the authors describe as PAGE — pedagogy, attributes of learners, goals, and engagement. The second proposes a new approach to analysing completion rates of active learners in the course. Active learners are those who continue beyond one week; these individuals are more likely to complete the course and receive a certificate.

The collaboration with Athabasca University has been highly productive, with the joint TELMOOC reaching participants in 132 countries. Our special thanks go to the authors, whose empirical research will be of interest to MOOC developers and researchers who ultimately aim to enhance MOOC completion rates. I invite you to critically reflect on this publication and expand the frontiers of our understanding about the possibilities that MOOCs present.



Professor Asha Kanwar
President and Chief Executive Officer
Commonwealth of Learning, Canada

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Introduction

This comprehensive overview of ten iterations of the Introduction to Technology-Enabled Learning MOOC (TELMOOC), covering their design and delivery over several years and during a global pandemic, tells a rich story of teamwork, networks, professional development, and innovative education delivery. Descriptive data from this project guide the presentation, drawn from pre- and post-questionnaires of all ten TELMOOC course deliveries. Throughout this book, we answer the questions *What makes TELMOOC unique? What made it beneficial, and to whom?*

In this chapter, we describe the TELMOOC design and present a selected literature review as well as an overview of the other chapters of the book. Integrated into this story, we present the data answering the research question *How did participants respond to the design and delivery of TELMOOC?*

Overview of the iMOOC Model

The following MOOC Design presentation is adapted from Ostashewski et al. (2017). The TELMOOC provides a professional learning and development opportunity for teachers who wish to expand competence in the use of technology in teaching and learning. The instructional design of the TELMOOC is based on a scaled version of the Community of Inquiry (CoI) conceptual framework. Course content and materials identified foundational theories and frameworks found in the fields of education and technology, including:

1. Community of Inquiry
2. Technological, Pedagogical, and Content Knowledge (TPACK) framework
3. Technology Integration Matrix (TIM)

Open educational resources (OER) and the development of such are key components of the educational materials for technology-enabled learning. Creative

Commons licensing agreements and permissions are presented, used and created, in detail, in the design and delivery of the TELMOOC.

Instructional Design

Three layers of instruction, drawn from the elements of Teaching Presence as described in the CoI instructional framework, support the TELMOOC pedagogy. A course instructor provides direct instruction, defined as delivering content, answering questions, and focusing discussion. A course learning facilitator introduces and summarises each learning module and provides both learning and technical support. The third layer provides community development support, peer-teaching support, and engagement encouragement through shared course design and teaching. This layer of instruction is provided by roving virtual teaching assistants, approximately one for every 250 active participants. These participants learn from one another in the TELMOOC through engaging in forum discussions and sharing their activity plans.

Direct instruction in course content is also delivered via video presentation. Video scripts are provided as visual support of the aural content presentation to support the many participants whose first language is not English. Content comprehension is reinforced by the course facilitator, the teaching assistants, and the course participants. Discussions, additional and/or related ideas, and resources are shared by everyone in the learning community. Learners are given the opportunity to test their learning through end-of-week multiple-choice quizzes, where unlimited attempts are provided.

Learners who complete the TELMOOC activities become eligible to receive a course certificate. The TELMOOC certificates included two levels of certification: Certificate of Participation and Certificate of Completion. To be eligible for the first, TELMOOC learners need to have passed all course quizzes with a grade of 80% and contributed five or more substantive posts in the course discussion forums. To be eligible for the more valuable Certificate of Completion, learners need to have passed all quizzes, contributed five or more substantive posts to the discussion forums, and received a pass on the instructor-graded TEL Activity Plan assessment.

TELMOOC is designed to be:

- learner centred and highly engaging via a multi-modal, media-rich online environment with direct instruction via video and text-based media
- facilitated via weekly introduction and closing videos, forum posts, and weekly summary PDFs
- supported by virtual teaching assistants who post throughout the course
- open and freely accessible
- a repository of relevant resources during and after the course
- a place to create and share lesson plan artifacts developed by participants as an outcome of the course (Ostaszewski et al., 2017, p. 432)

COL's MOOC4Dev platform, which uses the mookIT MOOC management system, was originally used to deliver the TELMOOC. Three particular elements

distinguish the mooKIT from other management systems. Aspects impacting instructional design are that

- video is a primary content delivery format
- synchronous and asynchronous interaction styles are available through forums and chat
- accessibility is maximised through low bandwidth requirements and alternate modes of access

One major design challenge in MOOCs that directly affects the quality of the learning experience is the element of teacher presence. Our design focus begins here as, according to Garrison (2016), it is teaching presence that supports both social and cognitive presence. When online education is delivered to thousands of learners, it is difficult to provide learning facilitation support, a key element of the CoI. Using traditional distance education design principles of transactional distance and teacher immediacy, and designing with the CoI presences in mind, the delivery of a multilevel approach to instruction in the TELMOOC was implemented. Three levels of instruction were designed for the MOOC: a live course facilitator (called the Inspirer), instructional ‘flat’ presence (called the Lead Instructor) and discussion forum facilitators (teaching assistants).

All three levels of teaching presence support individual learners and encourage the development of communities. The particular details of how the three levels of instructor presence were incorporated into the design are as follows:

- **Lead Instructor: University faculty member**
Providing a “flat” presence via prerecorded content videos, with transcripts and textgraphics placed in modules as multiple types of subject-matter presentation.
- **The Inspirer: University faculty member**
Providing an active, “live” teaching presence via informal video and text announcements, discussion board posts, and email support, acknowledging and addressing notable content contributions and incourse activities by learners.
- **Facilitators: Graduate students**
Providing a dynamic presence designed to provide support, direction, and sense of community with participants.

Teaching presence also highlights the importance of peer teaching. All levels of instruction offer participants information and encouragement about course contributions: opening discussion forums that they then facilitate, assisting a peer who has questions, and bringing related and relevant material and resources to the course.

Selected Literature Review

The TELMOOC design is an example of education development work done in continuous reference to related empirical evidence, as provided in peer-reviewed academic journals. This overview highlights critical pieces of information that shaped our thinking and the design and delivery of the TELMOOC. Our apologies

to the many other excellent scholars working in this burgeoning area of research not mentioned here. You continuously offer insights to keep us informed and working towards excellence.

The Technology Acceptance Model (TAM) as originally published (Davis, 1986) was an adaptation of an earlier theory called the Theory of Reasoned Action (Ajzen & Fishbein, 1980). This model has been reviewed, tested, discussed, and shaped as part of integrating technology in education. It was recently identified by Al-Emran et al. (2018) that the emergence of mobile devices and learning activities requires additional systematic review and synthesis of TAM studies related to flexible and mobile learning. In their analysis of 87 research articles published between 2006 to 2018, they concluded that additional consideration of technology acceptance must be added to reference m-learning. Supporting the emphasis on context as a continual reference in the TELMOOC, external variables that can decrease engagement and reduce engagement are more complex for mobile learners. They concluded that the acceptance process for m-learners may be a unique pattern that requires further examination. TELMOOC mobile learners are made aware of this uniqueness.

In addition to more work on TAM and mobile learning, Granić & Marangunic (2019) address the application of TAM in education settings through a systematic review of relevant literature from 2003 to 2018. For these researchers, the application of TAM outside education was well evidenced. Their work in 2019 provided “an overview of the current state of research efforts on TAM application in the field of learning and teaching for a variety of learning domains, learning technologies and types of users” (p. 2572). They concluded that TAM, in multiple versions and contexts, demonstrates a model that supports assessment of diverse learning technologies. Attitudes toward perceived ease of use and perceived usefulness are fostered in the TELMOOC through a clear description of the course and its activities at the start of the course.

Looking at the impact of TAM, Scherer et al. (2019) studied teacher adoption of teaching with technology. They reported that while multiple models exist to explain the integration of technology into teaching practice, TAM is the model in greatest use and has dominated the field. In a meta-analysis combined with structural equation modelling approaches, Scherer et al. “synthesized 124 correlation matrices from 114 empirical TAM studies ($N = 34,357$ teachers) and tested the fit of the TAM and its versions” and reported that “overall, the TAM explains technology acceptance well” (p. 13). While work remains to clarify key constructs and the impact of education context variables, TAM is well suited to support teacher professional development. Based on this and other current evidence available, we are comfortable using TAM as a central model in the TELMOOC.

Ongoing work is also needed to explicate the relationship between pedagogy and technology. TELMOOC discussion promotes the notion that teaching practice and learning processes well suited to traditional classroom delivery require adjustment when technology is introduced. Achieving meaningful, enhancing technology implementation in education has been studied for decades. In spite of what Ertmer and Ottenbreit-Leftwich (2013) identified as significant infrastructure investment of time and money, much work on what and how is best for technology integration remains. The TELMOOC works to offer an idealised type of training

and support, in an open model that allows individuals to apply learning based on their own situational limitations and opportunities. It follows Ertmer and Ottenbreit-Leftwich's premise of focusing on technology-enabled learning, and the pedagogy that supports it, rather than on tips, tools, and technology integration. Hence, the TELMOOC focuses on helping foster student engagement in social, constructed, technology-enabled learning environments. The technology-usage approach that underpins the CoI model (Garrison, 2016) serves in the TELMOOC as an experience and a model to adapt to individual contexts.

The CoI theoretical framework for deep, meaningful online learning was first explained in 2000 by Garrison, Anderson, and Archer. This new set of concepts expanded distance education pedagogy through the integration of technology. This model has, before and since, been applied to all types of education delivery formats (Anderson & Dron, 2011). For Anderson and Dron, generations of distance education are better explained by generations of pedagogy — that is, what the students are doing to learn — than generations of technological change, or the available learning technologies. This idea of considering both pedagogical and technological possibilities in combination is central to the TELMOOC; understanding one is not adequate without consideration of the other. In fact, high-quality education, with or without technology, through generations of cognitive-behaviourist, social constructivist, and connectivist pedagogy must be understood and applied according to disciplinary differences, education level, learning outcomes, and cultural contexts.

The Community of Inquiry

The CoI is perhaps the most important and encompassing approach when considering quality in online education delivery. The CoI was originally described as a consequence of research and practice in early textbased online learning delivery in the late 1990s. Incorporating quality education practices, the practical inquiry model, and the intersection of distance education theory, the CoI is a framework that addresses new online roles of the educator and learner. The CoI theoretical framework (Garrison et al., 2001) is the most widely referenced and widely used model for onlinebased learning due to its simplicity and versatility.

The CoI framework is a collaborative-constructivist process model that describes the essential elements of a successful online higher education learning experience rooted in Dewey's educational philosophy and social constructivism (Garrison, 2016). In a more practical sense, the CoI is a dynamic model of necessary core elements for both the development of community and the pursuit of educational inquiry, in any educational setting (Swan et al., 2009). The framework includes three elements, called presences: cognitive presence (CP), social presence (SP), and teaching presence (TP):

1. **social presence:** the ability of participants to identify with the community (e.g., course of study), communicate purposefully in a trusting environment, and develop interpersonal relationships by way of projecting their individual personalities

2. **cognitive presence:** the extent to which learners are able to construct and confirm meaning through sustained reflection and discourse in a critical community of inquiry
3. **teaching presence:** the design, facilitation, and direction of cognitive and social processes for the purpose of realising personally meaningful and educationally worthwhile learning outcomes

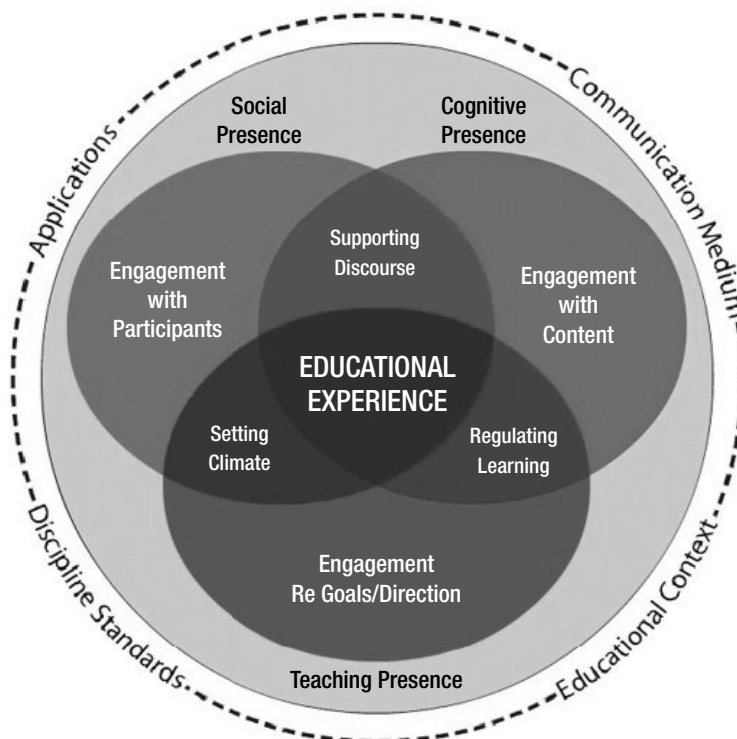


Figure 1.1. The Community of Inquiry Framework (adapted from Garrison et al., 2000).

Creating communities of inquiry in online education courses is a well-researched pedagogical approach. Early CoI research focused on describing and understanding social presence (Richardson & Swan, 2003) as a new construct supporting the expansion of teaching beyond direct transmission models. For practitioners, the CoI is about engaging learners in ways that allow for them to take the lead in their own education path, guided by the instructor, and supported by the content and their peers. This is in line with the move away from instructivist, institution-centred approaches and represents the revolution in education that is happening around the globe, as more and more educators come to understand the implications of digital information and technology-supported communication. The CoI provides a clearly articulated framework guiding how technology-enabled education is best implemented for any of the online, blended, or face-to-face learning environments.

From the viewpoint of an institution or an educator, the CoI offers a model from which to consider all aspects of online learning. Teaching presence provides

a clear description of the role of the online educator as the presider of the course. Teaching presence is defined (in the CoI) as the *design, facilitation, and direction* of cognitive and social processes for the purpose of realising personally meaningful and educationally worthwhile learning outcomes (see Table 1.1). Teaching presence begins before the course commences, as the teacher, acting as instructional designer, plans and prepares the course of studies, and it continues during the course, as the instructor facilitates the discourse and provides direct instruction when required. Through adequate teaching presence, formal learning that facilitates personally relevant and educationally defined outcomes is achieved. Implementing the CoI should be the goal of all online courses, as the benefits of this approach take advantage of the asynchronous and synchronous interactions of learners in ways that allow learners to participate as best they can and need to in order to support their learning. At the higher education level, more than at any other level of formal education, learners know best how they can learn. This approach meets that goal of learner-directed, learner-centred educational delivery.

Table 1.1. Principles of teaching presence

Principles	
A. Design	
1. Social presence	Establish climate that will create a community of inquiry
2. Cognitive presence	Establish critical reflection and discourse that will support systematic inquiry
B. Facilitating discourse	
1. Social presence	Sustain community through expression of group cohesion
2. Cognitive presence	Encourage and support the progression of inquiry through to resolution
C. Direct instruction	
1. Social presence	Evolve collaborative relationship where students are supported in assuming increasing responsibility for their learning
2. Cognitive presence	Ensure there is resolution and metacognitive development

Source: Adapted from Garrison (2006).

TELMOOC Research Methodology

TELMOOC research was planned and conducted in accordance with the approval of the Athabasca University (AU) board of research ethics. Both qualitative and quantitative data were collected from a sample of TELMOOC registrants (n = 18,248) who agreed to participate in the research study. Throughout this book, the pre-course survey results (n = 4,956) and the post-course survey results (n = 1,857) are used in the analyses presented. Surveys used included a series of questions in the pre-course survey directly related to the learner demographics, and the learning experiences in the TELMOOC for the post-course survey. Both surveys were approved by the ethics board of AU and complied with all the requirements of such an approval, including informed consent. Survey participants who provided

consent for this exit survey (presented on the first page of the survey) also completed a series of questions directly related to the learner–content interactions in the TELMOOC.

While much of the data presented in this book has been reported in each of the ten TELMOOC reports (available at <http://oasis.col.org>),¹ the collation and analyses of the aggregate data are the basis for the information presented throughout this book.

TELMOOC Participant Evaluation Responses

How did participants respond to the design and delivery of TELMOOC?

When asked to respond to the statement *Overall, I was satisfied with TEL MOOC*, a total of 1,604 of 1,845 (87%) respondents either strongly agreed or agreed. In reference to the TELMOOC community experience, 1,610 of 1,851 (87%) respondents strongly agreed or agreed with the statement *I felt like I was part of a community in the TELMOOC*.

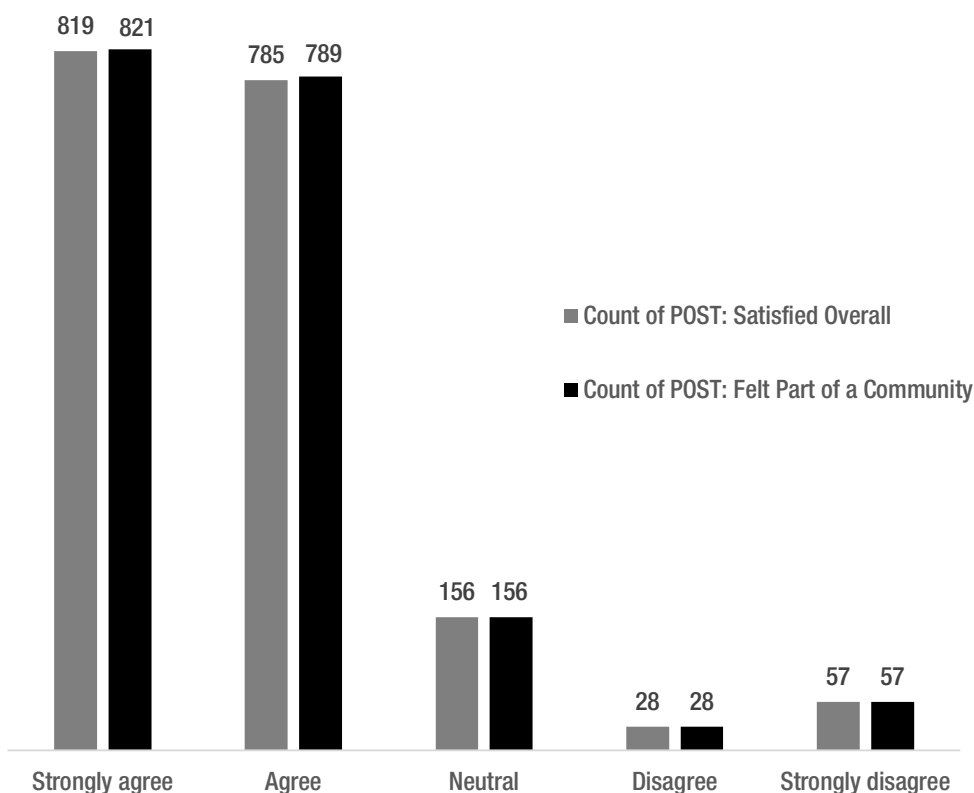


Figure 1.2. TELMOOC participant responses.

¹ The first of these is *Report of the Massive Open Online Course on Introduction to Technology-Enabled Learning (TEL MOOC)*, and subsequent reports have the same titles but with TEL MOOC 2, TEL MOOC 3, and so on.

The following descriptions were common responses to the TELMOOC experience, offered by participants who completed the course and received certification.

I learnt that there are many people with a lot of information that can help teachers to understand how to engage the technology. My learning in this course was significant for personal and professional development. Frameworks, OERs, SECTIONS. . . Each week was anticipated with interest and conscious awareness that I would be engaged in a meaningful way. This was appreciated as I was motivated to learn. Further, it showed a great model that can be studied and used with our students. The layout of the course facilitated additional opportunities to read, explore, review. . . I found it to be an easy way to provide exposure and expand our reach. Frankly, it enriched my learning beyond my expectation. My sincere thank you to everyone who shared and especially to the course team. The Inspirer, your thoughtfulness to invite us to your farm was appreciated because Covid-19 means that the image of the farm was a sight to behold. I was very inspired by the caring tone and encouragement by both presenters for participants to complete. I am exiting this course with the ability to assess frameworks to set quality pedagogical TEL activities and environments. I can locate OER that are purposeful for successful learning outcomes. This well executed TEL demonstrated in a practical way. My teaching practice gained the knowledge, utilized my skills and experienced the sincere attitude of the presenters, that modelled how we should engage our students in TEL. This entire TELMOOC would make better my teaching practice as an educator implementing TEL.

This course has provided me with a foundation of realising that it is not good enough to only talk about technology, in the classroom. But to realize that few years ago technology was viewed as a subject (its future projections in relation to human being), then it was viewed as a tool (what gadgets & software would be needed). In this TELMOOC, additionally I have learnt to incorporate another element, where technology should be used as a cognitive part. I learnt the availability & uses of OER. The frameworks (TIM, TPACK, SECTIONS, models etc.... above most, the Community of Inquiry were amazing. I'm going to share with other teachers in my school. I feel I have been reenergized in my teaching.

The knowledge acquired will make me a more effective instructor. This course has revealed the practicality of technology in any classroom and the way it enhances student learning. Traditionally my classes were dominated by lectures but with the information obtained during this course, technology will be a fundamental part of my class sessions. This approach may help to make subjects that are considered boring to be of more interest to the participants. In the early stages of incorporating technology I expect a few challenges with selecting the right resources however with more frequent use and practice it will prove valuable and more comfortable to implement.

Chapter Overviews

Chapter 2 describes the evolution of MOOC design. This background provides an historical point of reference for the design and development of TELMOOC. The narrative includes general MOOC evolution, the position of MOOC offerings in the education space, the contribution MOOCs can make in the Global South, and how the TELMOOC fits into, and adds to, MOOC history and evolution.

Chapter 3 reviews the importance of MOOC participant profiles in the design and delivery of this type of education innovation. The “open” character of MOOCs makes it difficult to assess the needs of the participants prior to course commencement. However, MOOC research over time has identified patterns in MOOC participant characteristics (Aydin & Yazici, 2019; Leitner & Ebner, 2019). These participant patterns are considered first in reference to pedagogical processes. The TELMOOC participant population is similar to MOOC participant patterns in general, with some exceptions. The chapter concludes with ideas about MOOC design and delivery affordances that may (i) better meet the needs of MOOC participants and (ii) encourage a new profile of MOOC participants who can engage and succeed in technology-enabled lifelong learning opportunities, such as MOOCs.

Chapter 4 provides an overview of learner engagement in online learning and, more specifically, in MOOCs. Key to engagement are learner interactions, and as such, we take a closer look at how the TELMOOC design and deliveries supported the course. Of particular note is the contextualisation of the course for learners as moderated by the course delivery team. Exploring and understanding how TELMOOC addressed learner engagement can help other educators looking to improve their own teaching practices.

In Chapter 5, we take a detailed look at MOOC completion rates reported in the research literature and examine their validity as a measure of quality. Exploring the TELMOOC deliveries based on existing MOOC completion rates — where course certifications are compared to course registrations — results in an average completion rate of 20.2% over ten TELMOOC deliveries. We argue that a more accurate representation of MOOC completion rates should include consideration of active learners; hence, fully active learner numbers rather than registration numbers should be used in calculations of MOOC completion rates. In the case of the TELMOOC, using the fully active learner metric results in a completion rate of 70.3%, which we feel accurately represents the TELMOOC completion rate and brings the TELMOOC on par with high-quality formal institutional education deliveries.

Chapter 6 presents the MOOC Success Framework as a discussion of design and delivery strategies that impact MOOC quality. Pedagogy, attributes of learners, goals of the MOOC, and engagement are what we consider key pillars of MOOC quality. We share strategies integrated in the TELMOOC design and tactics employed in the delivery so that “lessons learned” can be applied elsewhere. While these strategies and tactics can be used for other MOOCs, they can also be used to understand and clarify underlying reasons for learner completions in formal courses and identify potential interventions for struggling learners.

Chapter 7 turns to professional development opportunity through the TELMOOC. As our societies have become more and more complex and the need for highly educated teachers continues to grow, the topic of professional development plays a pivotal role in keeping educators aware of the advances in their profession. Unlike any other time in history, digital information and technology advances in the 21st century have provided significant opportunities for the advancement of education practice. Educators, however, are engaged in education, and finding ways to provide them with meaningful, effective professional learning opportunities is challenging. This chapter provides a description of how effective and valued TELMOOC was for professional development, as reported by participants.

Chapter 8 provides a brief summary of the findings and the recommendations that emerged from this TELMOOC research.

Conclusion

This chapter has provided an overview of the value of MOOCs, the TELMOOC, and this book's chapter-by-chapter description of both. Using formative assessment and continuous design, the TELMOOC has demonstrated high levels of participation, satisfactory completion rates, and notable OER development. We believe that participant engagement in shaping the course allows for active adjustment to individual learning needs and contexts. This and other key design and delivery elements are what make the TELMOOC design and delivery processes exemplars for MOOCs, teacher professional development, lifelong learning, and digital education broadly.

More research will be done to identify whether and how the scaled CoI model contributed to increasing rates of learner success across ten sessions of the course. Looking to asynchronous discussion and synchronous live session transcripts, using the CoI transcript analysis tool (Garrison et al., 2006) with modifications as suggested by Kaul et al. (2018), will provide information about future modifications, particularly for inservice teachers.

As a point of departure, Chapter 1 offers an overview of the entire book. This book, in turn, creates a first presentation of a digital learning design map. This map provides the details of how the TELMOOC was created and then enacted, as an example of the content and exercises expected by those wanting first-in-class technology-enabled education. TELMOOC completers are well equipped to design and deliver MOOCs, teacher professional development, professional development in any field, and digital education at any level.

Post-Covid education is not an either-or story; it is an opportunity to combine available teaching and learning methods to meet diverse accessibility requirements and expansive individual and societal demands. Applications of digital, online, technology-enabled teaching and learning with traditional delivery will best serve us going forward. However, as always, expert design and delivery to attain effective teaching, complete learning, and satisfying outcomes is required. The TELMOOC supports using many methods to assist people of any level and age, anywhere in the world.

The TELMOOC in the History and Future of MOOCs

This chapter offers a review of MOOC evolution as context for the design and development of the TELMOOC. The narrative reviews general MOOC evolution, the position of MOOC offerings in the education space, the contribution MOOCs can make in the Global South, and how the TELMOOC fits into, and adds to, this history and evolution.

Background Information

The Commonwealth of Learning (COL) approached the authors of the book to develop a MOOC entitled *Introduction to Technology-Enabled Learning* (TEL) to support its capacity-building role in the Commonwealth countries (Mishra et al., 2020). The faculty and staff at AU served as learning designers, instructors, and researchers for the TELMOOC in reference to AU's mandate. This mandate is part of past and current institutional strategic plans. It is dedicated to removing barriers that restrict access to high-quality education and to increasing equity in educational opportunities for learners worldwide. In keeping with this commitment, the TELMOOC was created with consideration of opportunities and barriers identified in previous MOOC designs. Distance education instructional design and appropriate online pedagogical processes were used to evaluate scaled learning engagement offered by xMOOC and cMOOC design and delivery (Porter & Beal, 2015). Like all MOOCs, the TELMOOC provides a free, convenient, and accessible learning opportunity to all interested participants. In addition, the TELMOOC supports both self-paced (within the timeframe of the MOOC duration), independent study and collaborative, constructed connections to instructors and other students, if desired. To offer this supported collaborative community design, the TELMOOC is an inquirybased learning opportunity, created as a scaled version of the CoI theoretical

framework (Garrison et al., 2000). Designed with teachers and education developers of the Global South in mind, especially those in the Commonwealth, the TELMOOC provides opportunities to expand existing knowledge and skills regarding the use of technology in teaching and learning environments.

Understanding MOOCs

By design, the TELMOOC is a massive open online course. MOOCs are large open online courses that began as an opportunity to provide informal, noncredit learning opportunities and access to knowledge experts previously out of reach for many. A disruption of longstanding education practices (de Freitas et al., 2015), MOOCs have been reviewed, evaluated, and redesigned for multiple purposes. The range of designs and evaluations have included the micro level of the student learning experience, the meso level of organisational change, and the macro level of collectives or societies (Calvo et al., 2020). MOOCs can provide opportunities not previously available. In fact, the same MOOC can (i) offer attention to a diversity of learners' needs, (ii) support new forms of teaching and learning to enhance formal, creditbased education, and (iii) introduce scientific knowledge and culture to citizens (Agasisti et al., 2018).

MOOCs are one response to a longstanding desire to provide affordable, highquality education to the global masses. They are also defined by pervasive pressure to restructure education in response to societal demands, where "self-development is regarded higher than diplomas and degrees... as universities try to reach more and more learners with less cost" (Kesim & Altınpulluk, 2015, p. 16). For these authors,

MOOCs are internet based educational environments that provide the opportunity to take classes from elite universities and instructors through environments such as videos and presentations through open and free courses and course schedules with no formal degrees, certification or accreditation for the purpose of the self-development of knowledge and competences by individuals. (p. 16)

According to Baturay (2015), MOOCs must be open, distributed, and participatory. Learning activities are characterised by

open access, global, free, videobased instructional content, problem sets and forums released through an online platform to high volume of participants aiming to take a course or to be educated. With time and place flexibility, MOOCs gathers scholars and learners around the world. (p. 432)

Many of the accolades given to MOOCs are attributes of existing online learning practices. MOOCs, however, have a dedicated interest in providing access such that costs must be minimal, monitored, and measured against benefits. Openness is a priority.

As with many forms of online education, MOOCs can

- increase access where bandwidth and digital availability allow it
- foster equity in the learning environment when designed to ensure participation is colour, gender, and class neutral
- offer engaging but affordable, flexible, and convenient learning opportunities
- provide the opportunity for participants to develop expanded lifelong learning skills related to self-direction, self-regulation, and collaboration

MOOC Development Over Time: A Brief History

The path to MOOCs

Understanding the tenets of distance education provides a rich grounding from which to consider the value of MOOCs and why this type of learning opportunity evolved. It also lays the groundwork for assessing what MOOCs must provide to add value to existing learning opportunities already available. Taylor (2001) was one of several authors to outline the evolution of distance education itself, a teaching and learning space characterised uniquely by the separation of the teacher and learner. Critical to the distance education mandate to increase inclusion and accessibility is the characteristic of place and time flexibility. This is added to the sound pedagogical processes required of any education opportunity, such as current, high-quality material, explicit structure and requirements, and clear completion outcomes.

Distance education delivery across time and space changes as information and computer technologies develop. Interaction becomes the new refrain as a way to increase learner engagement and effort, but often in competition with the previous commitment to the convenience of independent, selfpaced, flexible learning. This tension between interaction and collaboration and open, flexible, selfdirected learning remains today in the development of technology-enabled online distance education, where MOOCs are one example.

The first postsecondary students engaged in Internet-based distance education in the 1980s (Keegan, 2013). The first fully online course was created ahead of widespread access to the Internet through a campus network at the University of Toronto. Shortly after, the University of Phoenix launched fully online bachelor's and master's programmes (Goodwin, 1993). Soon, large groups of students at open universities, which traditionally offered distance education programmes, began using online technologies. At distance education institutions, the use of technology had to be offered in line with long-standing imperatives: provide quality education to expanding audiences for the sake of inclusive, equitable education opportunities for those previously left out of elitist, geographically bound, costly, place-based programmes. As one example, Athabasca University acts as Canada's open and distance university. While originally a high-quality distance teaching university, it now offers a costeffective, flexible approach to online undergraduate and graduate programmes.

MOOCs take open, flexible, accessible learning delivery a step further, allowing often free access to any interested participant willing and able to register in the course. However, this new version of distance and online delivery does not uniformly carry all the requirements of an effective, planned distance and online learning experience.

Early MOOC offerings

In 2008, George Siemens and Stephen Downes created and delivered the first large, connectivist networked course (Fini, 2009). The course *Connectivism and Connective Knowledge* was piloted with fee-paying students for credit. The same course became an open, online version, complete with video lectures, discussion forums, and weekly online sessions. Anyone who wanted to participate was free to do so without registration, fees, or credit. Freely open material was available online. Learning activities occurred on multiple platforms, including Facebook, Wikipages, and blogs. Autonomy, peer teaching and learning, and networking were keystones to the experience. Over 2,300 learners engaged in this first massive open online course and, with credit to Dave Cormier who coined the term (Buhl & Andreasen, 2018), the label MOOC emerged.

This was MOOC history in the making. Although reports vary, Professors Sebastian Thrun and Peter Norvig of Stanford University followed this lead and, four years later in 2012 offered the online course *Introduction to Artificial Intelligence* for free. Less student-centred and active, the course emulated traditional higher education with a behaviourist approach to content-focused learning. More than 160,000 participants from 190 different countries registered. This exemplar was the impetus behind the creation of Udacity (Rodriguez, 2012), with courses originally linked to university content and well-known professors delivering virtual lectures. The pedagogical design remains video lecture-based with automated learning assessment.

Emerging at this point in MOOC history were two very different MOOC design and delivery styles. Following Stanford's more traditional approach to education even in an online, massive course, three other groups were next to emerge offering their own MOOC models: Coursera, edX, and FutureLearn. Over the past decade, these initial MOOC providers have grown and developed, offering scaled learning opportunities with varying pedagogical designs, fees, and credit/micro-credit provisions to millions of students anywhere the Internet and bandwidth are available. Other providers, such as Udacity, SWAYAM, Canvas, Khan Academy, and Udemy, are also offering web-based learning alternatives. Currently, the largest MOOC providers are Coursera, edX, FutureLearn, SWAYAM, and Udacity (Ossiannilsson, 2021).

Coursera has grown, since its inception in 2012, into a major corporate structure and is currently the largest MOOC provider in the world. The model is based on partnerships with hundreds of universities and many corporations, including Fortune 500 companies.

In 2016, Coursera announced this significant shift to capture the corporate elearning market, a market much larger and [more] robust than traditional higher education. Their pedagogy includes a more

sophisticated model of learning activities than original MOOCs, but courses are no longer free. (Cleveland-Innes & Ostashevski, 2019, p. 5)

Twenty-four million students enrolled in 2,000 Coursera courses in 2017; this has now increased to more than 6,000 partnerships and 82 million MOOC participants (Ossiannilsson, 2021). At about the same time, another MOOC provider emerged. Professors at Harvard University and MIT created a MOOC system. This platform, named edX, offered open and free online courses to anyone, anywhere. Collaboration with education institutions, non-profit agencies, and corporations created a cross-institutional infrastructure. Recently, edX began offering micro-degrees through cooperating institutions. Approximately 1,300 courses are free to participating students. Other courses include varying fees, some with additional activities and some offering credit; up to 10 million participants in total have enrolled in courses since edX began these offerings five years ago. The story of edX began as an experiment, expanded to a global movement, and continues as a scaled and innovative version of higher education via the Internet (Joksimovic et al., 2017).

Within and beyond these key contributors in the MOOC movement, development continues. New developments carry continued innovation and improvements. Open universities of the UK and Canada research and offer MOOCs in reference to long-standing requirements for distance and online education, seeking to balance access, quality, and cost-effectiveness. Similarly, Germany has created Iversity, originally for blended learning support. This platform now offers a combination of free and tuition-based courses to thousands of students worldwide.

Research conducted on MOOCs in the initial phases “was often basic and it was the minority of studies that were informed by methods traditionally associated with qualitative research (e.g., interviews, observations, and focus groups)” (Veletsianos & Shepherdson, 2016, p. 1). Although limited in scope and diversity of pedagogy, language, and geography, early research identified MOOC challenges as course non-completion, prohibitive costs, lack of large group teaching methods, and narrow assessment opportunities.

In a more recent review, Cagiltay et al. (2020) suggest that

MOOCs’ high dropout rates or predominantly elite participation are considered to be important problems. In order to develop solutions for these problems, a deeper understanding of MOOCs is required. Today, despite the availability of several research studies about MOOCs, there is a shortage of in-depth research on course characteristics, learner characteristics, and predictors of certification rates. (p. 121)

As MOOC development continues, varied instructional design models are being used to create more engaged and supported learning. For Reich and Ruipérez-Vallente (2019), earlier predictions of MOOCs as a disruptive force in higher education have not materialised. Instead, MOOC learners are most often one-time attenders, MOOC growth has a demonstrated bias toward the most affluent countries, and, even given this bias toward more elite educated learners, completion rates have not improved. These shortcomings, identified over time, were of concern in the early

days of MOOC design. Scholars embedded in distance education research began to consider alternatives (Margaryan et al., 2015; Sangrà et al., 2015).

MOOC research and design at Athabasca University

In order to move beyond place-based types of higher education, Athabasca University acts as Canada's open and distance university, offering a cost-effective, flexible approach to undergraduate and graduate study through online learning with minimal or no physical residency requirements. Through the lens of distance education practices, online learning adds to the design of self-paced, independent study, print-based correspondence course models by including interaction and collaboration.

Shortly after the emergence of edX and Coursera, researchers and education developers at AU began to study the learning design of these early MOOCs. The MOOCs seemed to have surfaced without reference to research or design in distance and online learning. What appeared to be a commitment to openness and access overshadowed other critical pedagogical pieces such as instructional design, engagement, diversity, and support for student self-direction. (Cleveland-Innes et al., 2015).

To reiterate, MOOCs take learning access a step further, allowing open access to any interested party who signs in and partakes of the experience. Early MOOCs, a new version of online learning, missed the requirements of a sound, measured learning experience with appropriate and necessary outcomes. For Davidson (2012) "far too many of the MOOC's... use talking heads and multiple-choice quizzes in fairly standard subject areas in conventional disciplines taught by famous teachers at elite universities," which does nothing but "massively scale what is broken" (paragraphs 16 and 17). In other words, MOOCs attempted an open extension of the teaching model used in lecture-based delivery in place-based institutions (xMOOCs) or dismissed teacherled learning completely and handed learning structure and leadership over to the learners themselves (cMOOCs). In response, AU MOOCs — designed by those already familiar with the major tenets of distance, open, and online education — looked to add scale to what was already known about online and distance education, resulting in a MOOC that could engage and support large numbers of participants. The TELMOOC offers such a MOOC design.

Open education movement

For Gea (2016), MOOCs and the open learning movement impacted society simultaneously in 2012. "MOOCs are a free distance learning option with a global reach, attractive audio-visual resources, and motivation techniques based on gamification and peer review" (Gea, 2016, as cited in Nieves et al., 2019, p. 33). This provides one way to consider MOOCs as a major contributor to the open education movement. However, Cormier and Siemens (2010) had begun the discussion of this relationship earlier and suggested that "the word open is in constant negotiation ... the openness of the academy refers to openness as a sense of practice. Openness of this sort is best seen as transparency of activity" (p. 32). While the

word “open” exists within the name of massive open online courses (MOOC), the definitions of both continue to evolve.

More recently, Stracke et al. (2019) suggested that “open education gained more visibility as a result of the emergence of open educational resources (OER) and massive open online courses (MOOCs)” (p. 1). For this group of researchers, MOOCs can enable the use and creation of OER and can be exemplars of open education practices (OEP). To offer a fully open MOOC requires a design that employs OER and is open by way of accessibility, engagement, and contribution. All MOOCs designed between AU and the COL are designed for both. This supports one piece of the iron triangle (Daniel et al., 2009), accessibility. The requirement for affordability was originally part of the MOOC movement. Education costs have led to required additional revenue streams such as institutional membership costs and participant tuition fees.

TELMOOC design and delivery

As outlined in Chapter 1, TELMOOC seeks to offer participants the opportunity for an open education experience while gaining the knowledge and skill needed to design and deliver technology-enabled learning. Lessons learned from research on other MOOC design and delivery provided insight about building on the strengths of previous MOOCs while adjusting the design for a more interactive and collaborative MOOC experience. In keeping with Naidu et al. (2018), OER and OEP can and should be part of all MOOCs. Like these authors, we chose to “push the boundaries of the design of MOOCs and especially for continuing professional development of practitioners” (p. 188), particularly for those education practitioners in the Global South.

One unique feature of the TELMOOC is the use of inquiry-based learning methods in a MOOC environment. This is an opportunity to challenge what are often transmission model and behaviourist approaches. The community of inquiry pedagogical framework for online and blended learning (Vaughan et al., 2013) provided a foundation upon which to reference a more engaging, interactive, and collaborative MOOC design and delivery. This is inquiry-based learning at scale (Cleveland-Innes et al., 2019) and is a remedy to what we now know could be a shortcoming in other MOOC designs. Coursera, edX, Open Learning, and Iversity “are high in learner-system interactivity and learner-content interactivity... (but) learner-learner interactions and learner-instructor are significantly lacking” (Gamage et al., 2020, p. 107).

Scaling the Community of Inquiry

Amemado and Manca (2017) also noted these significant shortcomings in prevalent MOOC design, suggesting that “the range of pedagogical practices currently used tends toward an objectivist-individual approach” (p. 23). This traditional, more behaviourist approach has been questioned in the higher education reform movement, and many MOOCs appear to be more replication than innovation. In other words, “identification of effective learning design has become one of the

key challenges facing education today and massive open courses specifically” (Amemado & Manca, p. 23). As far back as 2014, Gasevic et al. (2014) identified a lack of methodological or theoretical rigour in early MOOC design, delivery, and research, suggesting that offering any kind of social learning approach would prove difficult until more evidence about the challenges of such learning could be identified.

Drawing from research about distance education design (Abrami et al., 2012; Jaggars & Xu, 2016; Shearer et al., 2015), student engagement in large lectures (Egelandsdal & Krumsvik, 2017; Ludvigsen et al., 2015), and research about the community of inquiry framework for online learning (Blayone et al., 2017; Ice et al., 2011; Richardson et al., 2012), our inquiry-based MOOC design employs three levels of dedicated instructional support, with a critical focus on facilitating connections among MOOC participants. These three levels of support are designed in reference to the three subcomponents of teaching presence as understood in the CoI framework.

Table 2.1. Teaching presence sub-components applied to MOOC design

Subcomponents	MOOC design
<p>Direct Instruction: Just as it sounds, this component of teaching presence ensures that engagement with content follows required course outcomes. It includes keeping the discussion on track, reaching the intended goals in a reasonable period of time, diagnosing misconceptions, providing information where necessary, and confirming understanding.</p>	<p>This component is shared with two roles in our MOOC design. First, the content instructor provides videos that highlight content, identifies course material, reviews content goals, and encourages active participation. Second, the course inspirer monitors course engagement, clarifies understanding, encourages participation, and supports the development of community connections.</p>
<p>Facilitation: Facilitation responsibilities in teaching presence rest on encouraging and supporting social and cognitive presence. For example, connections among students, including discussion and synchronous engagement, are critical and, accordingly, must be supported. It is important to allow students to do the same, and that the instructor not get too involved. The instructor must offer the right balance of not too much and not too little involvement in facilitation. Let the students support each other.</p>	<p>In this MOOC design, virtual facilitators are first and foremost participant greeters and supporters of community connections. One facilitator is assigned for every 250 participants, but not to a designated group. This ratio and assignment to anyone in need allows support for the development of community but limited attachment to the facilitators themselves. Facilitators also direct participants to solutions when technological or pedagogical difficulties arise.</p>
<p>Design and Organisation: This component of teaching presence is the establishment of content, activities, and timelines. However, it is very important that this not be seen as static. Included must be the opportunity for input to change over time. For example, at the beginning of a course, expectations should be discussed, and students should have an opportunity for input on how reasonable those expectations are. During the course, as issues arise, these should be explored, and as long as required learning outcomes are still addressed, changes should be supported.</p>	<p>MOOC design and organisation starts with flexible boundaries that lead to required academic/ accreditation outcomes. What is flexible is the opportunity for students to add ways to reach these outcomes or perhaps even add to the outcomes. All three MOOC instructional roles support and suggest this self-directed, empowered, and engaged work on the course as well as in the course.</p>

The Future of MOOCs

MOOC development into the future

For Zawacki-Richter et al. (2018) and others (Moreno-Marcos et al., 2018), current MOOC research and development rests on the following:

- the opportunities and challenges of MOOCs as a type of education delivery for formal university programmes
- useability and cost of MOOC platforms
- MOOC content, language, and learner diversity
- teaching and learning design and resulting quality issues

They also suggested that more topics must be researched.

A central premise in MOOC design and delivery is that verifiable knowledge should be accessible to all (Nieves, 2019; UNESCO, 2021). This is not more of the same but must embrace and deliver pedagogic transformation in support of virtual and blended environments, where inclusive, collaborative, community-based education experiences will work toward content-based learning outcomes through universal design and provide personal development opportunities. These personal development opportunities seek to allow participants to become self-directed lifelong learners, skilled collaborators, and learning leaders. Currently, the world's most prestigious educational institutes reaffirm MOOC experiences as innovative technologies that democratise education and create open learning communities (González et al., 2018). That said, "MOOCs suffer from massive dropouts and require new pedagogies, methodologies, and evaluations adapted to a massive scale" (Loeckx, 2016, as cited in Nieves, 2019, p. 33).

MOOC outcomes and lifelong learning

While many higher education institutions have both tested and tried varying types of MOOC delivery, they have often targeted participants currently excluded. Other MOOC providers have focused on participants not in traditional higher education or those looking for alternative ways to develop competence. The *Education 2030 Framework for Action*, adopted by UNESCO in May 2015, sees lifelong learning as a central principle of a new education where "all age groups, including adults, should have opportunities to learn and continue learning" (Calvo et al., 2020, p. 3250).

MOOCs have the potential to support the new social contract for global education suggested by the UNESCO Report from the International Committee on the Futures of Education (UNESCO, 2021). This new social contract will expand education in several ways. First in this new social contract is a commitment to lifelong learning, which is researched in the MOOC literature (see, for example, Babanskaya et al., 2016; Buhl & Andreasen, 2018; Steffens, 2015). While MOOCs are still being researched and redesigned, as is the opportunity to address the needs of multiple and diverse age groups, MOOCs do offer one possibility for cost-effective, accessible, high-quality lifelong education.

Looking to a new education by 2050, UNESCO (2021) asks that, in addition to lifelong education, all should consider that "healthy educational ecosystems

connect natural, built, and virtual sites of learning... [that] support the public, inclusive and common purposes of education” (p. 149). Open access through digitally safe open-source platforms is a requirement. Collective sources of equitable public financing and regulation of education will ensure diverse modes of learning are offered to culturally and socially diverse participants. The broadest right to education must include but go beyond schooling. In this process, learning engagement must go beyond age, beyond culture and language, and beyond social status. Finally, collaboration, community, and connectivity must be built in.

MOOCs and the Global South

The TELMOOC is a collaborative product in a partnership between AU and the COL. The effort to design, market, and offer the TELMOOC supports the international effort to realise “the express goal of enhancing national and local capacity and supporting countries to learn from one another” (UNESCO, 2021, p. 136). Our work leads us to ask our global participants what they need from MOOCs in the future such that we can prepare our response. Will MOOCs become main agents of workplace skill and knowledge development or serve an audience of those outside the workforce? Perhaps an even bigger question is *What MOOC design and delivery standards for high-quality MOOCs, available anytime, anywhere, to anyone, could provide a base of quality for all MOOCs?*

Issues of MOOC credentialling and, more importantly, credibility, are still being researched. Every MOOC is a development opportunity for the individual and for society. This means content must address appropriate subject matter and engage learners in a learning atmosphere that acknowledges and supports cross-cultural engagement, resulting in socially appropriate and developmentally safe and supportive environments that bring participants together in collaborative and engaging ways. We must consider how far we could reach through modelling inclusion and respect that would bridge current differences.

MOOC designers could consider Trow’s (2006) evolution of education beyond service to the elite in support of the status quo and find more ways to offer education for the broadest greater good. For Reich and Ruipérez-Valiente (2019), this is happening in MOOCs. While MOOCs may lean toward mass education, they will not meet our global needs if such education is not designed as universal education (Nieve et al., 2019). MOOCs must be designed for diverse populations but shaped by those in local contexts for relevant purposes.

Conclusion

TELMOOC design and delivery has worked to move in new directions for learners, a range of institutions, and global societies. The pedagogical approach offers both content to be mastered and development of the individual as an advocate for technology-enabled teaching and learning. In keeping with the views of Ossiannilsson (2021) and the main premises of the community of inquiry theoretical framework, learning of all types should be considered a human right and work toward general human progress. The Covid-19 pandemic has added to the sense

of urgency about education reform, in which MOOCs and the CoI can both play significant roles (Bozkurt et al., 2017, 2020; Korkmaz & Toraman, 2020).

During the COVID-19 pandemic, the education system was challenged, and the limitations became highly visible, especially the difficulties faced by vulnerable groups. Lifelong learning, equality, and liberation were key issues dealt with by societies to ease tensions between inside and outside organizations and enable boundaryless thinking and seamless learning. (Ossiannilsson, 2021, Discussion)

With the appropriate design and delivery, a dedicated commitment to open access, and collaborative engagement among MOOC participants everywhere, these immediate and long-term education goals can be achieved through MOOCs. The TELMOOC works to offer such an example.

MOOC Participation and TELMOOC Participants

This chapter reviews the importance of MOOC participant profiles in the design and delivery of this type of education innovation. The open character of MOOCs makes it difficult to assess the needs of the participants prior to course commencement. However, MOOC research over time has identified patterns in MOOC participant characteristics (Ruipérez-Valiente et al., 2020). We first consider these participant patterns in reference to pedagogical processes. The TELMOOC participant population is similar to MOOC participant patterns in general, with some exceptions. The chapter concludes with ideas about MOOC design and delivery affordances that may better meet the needs of MOOC participants and encourage a new profile of MOOC participant to engage and succeed in technology-enabled lifelong learning opportunities, such as MOOCs.

Introduction

The original purpose of MOOC design and delivery, beyond the excitement of creating large, informally structured learning via the Internet, was to offer knowledge and skill development to those unable to do so via traditional education opportunities. Initial tests of the idea by Stephen Downes and George Siemens demonstrated education potential for such large enrolment courses. edX and Coursera emerged with MOOC delivery platforms. As MOOCs promised to democratise higher education through improved access to societies' greatest researchers, visions of access for all socially and economically impoverished students buoyed the original dream (Healy, 2017). What could be explained as an instructional design error ensued.

Individuals unfamiliar with the requirements of independent, self-directed, remote teaching and learning will struggle without support and guidance. Individuals without prior access to post-secondary higher education will lack the

experience required to read thoughtfully and critically, pay attention to lectures, and have the study skills and discipline acquired through advanced study programmes. Add to this the additional measure of self-direction required of independent, self-paced, and self-managed distance education, and two predictable outcomes are the result. MOOC research findings indicate that most MOOC registrants and completers are already successfully credentialed students (Healy, 2017; Neuböck et al., 2015). Participant characteristics such as age, gender, education, and online experience can predict important MOOC engagement factors like goal setting and activity level (Li, 2019).

MOOCs offer participants access to knowledge, often presented by the most qualified academic experts in many fields. In addition, MOOCs offer participants access to others interested in and working in similar fields. This networked learning can help participants enhance their career and personal networks. As current MOOC participant research suggests that the most privileged members of societies, those well employed and well educated already, form the greatest number of MOOC participants, MOOC research and redesign must guide us to further engagement of those less privileged (Deng et al., 2019). “Little is known about MOOC learners with financial constraints and who do not fit the typical profile of MOOC learners” (Dillahunt et al., 2014, p. 1).

Those less educationally experienced are not necessarily less academically able. Dillahunt et al. (2014) and others have suggested these less experienced MOOC participants can be some of the highest performing. Learners without the opportunity to pursue formal education previously were compared to those who had access in reference to age, gender, motivation, engagement, and completion. Primarily male and over 25 years old, with less than four years of college, this group demonstrated a statistically significant and proportionately higher rate of completion with certificates of distinction. Based on this research, Dillahunt and colleagues suggested how MOOCs might be adapted to better address the needs of learners.

Referencing the CoI requirements, the TELMOOC is designed in ways that support and encourage participants to assist with shaping the course design, engaging in peer support, and sharing facilitation throughout the course. This modified, scaled approach of a CoI pedagogical process (Garrison, 2016) is meant to include participants of all backgrounds. This allows those less privileged or outside the group with high levels of education and employment an entrée to a more communal, supportive, inclusive learning opportunity. Without significant MOOC learning design changes, the original target audience for MOOCs will continue to underrepresent those unable for financial and other reasons to pursue a more traditional path to a postsecondary education.

Background Information

The MOOC research and delivery experience provides valuable information about participant profiles and engagement. This historical and research background covers a wide variety of populations, geographic locations, design processes, delivery mechanisms, and subject areas. Below is a snapshot of recent studies and reports adding to the knowledge base about MOOC participants.

As indicated earlier in this book, MOOCs were originally designed to create networked learning opportunities and share knowledge gains emerging from universities with the wider population. As this education innovation appeared and developed, its implications for the developing world became evident (Patru & Balaji, 2016). The mission of the United Nations to create sustainable development, with the important role the COL could play in this as a MOOC developer, led to the support and implementation of many MOOCs, including the TELMOOC. The design and delivery of MOOCs targeting diverse populations from wide-ranging socio-economic and linguistic realities must provide the flexibility to reduce barriers in any context. The TELMOOC is such a MOOC. To respond to this breadth of participants, engaging, flexible learning materials and activities seek to allow maximum participation for all.

Healy (2017) provided a detailed analysis of Georgetown University's first six MOOCs. Demographic factors drawn from participants registered in these six courses were correlated with learner intentions and course performance factors to identify who was taking and succeeding in the MOOCs as offered by the university. Students identifying as female enrolled in MOOCs about economics were more likely to sign up for a course and then never log in. This same student group demonstrated a shorter duration between a course's start and their last login. To summarize, this group was more likely to register but not participate. But when actively participating, they proceeded through the course activities more quickly than other gender groups.

From the perspective of TELMOOC designers, Healy (2017) suggested that MOOCs are improved by first deciding on the goal or goals to work toward. Thus, it was agreed to set goals for the TELMOOC in line with the needs of participants from the Global South. Rather than a more content-focused design to be delivered to whomever chose to come, the TELMOOC's design was drawn from past research on online learning principles meant to engage and satisfy diverse learners. As "MOOCs serve a population of mostly highly educated learners" (Healy, 2017, p. 34), attracting and keeping those with a wide range of education levels and background characteristics means a unique marketing approach and a pedagogical design that is flexible and accessible. "Looking within the individual course experience, MOOC creators may be able to find clever, technology-based interventions for supporting students at particular risk of dropping out" (Healy, 2017, p. 35).

To add notions of context and the important role of self-regulation to our view of MOOC participants, we considered the research of Hood et al. (2015). For this research group, the virtual, distance, and open characteristics of MOOCs "require individual learners to self-regulate their own learning, determining when, how and with what content and activities they engage" (Hood et al., 2015, p. 84). For this group, this requirement is mediated by participant learning and professional contexts. Their findings demonstrated significant differences between working learners, those enrolled in formal higher education, and those involved in only one or neither context.

This working, professional context is highly represented in the TELMOOC. MOOCs as a scaled version of the CoI — that is, for a high rate of participation — begin the teaching and learning relationship with activities to foster social

presence. This provides a view to the place and context of other participants. A welcome forum encourages participants to identify themselves by their first name, occupation, and general geographic location. Participants are introduced to each other, particularly where shared demographic characteristics or contextual similarities are noted by virtual student-facilitators. As Hood et al. (2015) reported, there is “clear evidence for the relationship between a learner’s context and role and their self-regulation of learning in a MOOC” (p. 89), so the opportunity for MOOC participants to clarify, share, and talk of learning applications in professional work illuminates diverse contexts in beneficial ways. The examples of this self-directed, self-regulated learning are of value to those who may be less enabled, by their individual context, to do so.

TELMOOC Design Considerations

Important pedagogical design ideas like context and self-directed learning can improve access to full engagement in MOOCs. Kizilcec et al.’s (2017) research confirmed gaps and suggested changes to MOOC design. “Judged by completion rates, MOOCs do not spread benefits equitably across global regions. Rather, they reflect prevailing educational disparities between nations” (p. 251). Participant elitism is noted in the 25 million plus MOOC registrants across the globe between 2012 and 2015, with 39% coming from less-developed countries. The continuing story is that participants from more developed countries register more often in MOOCs and that the educated and affluent from any country are more likely to register for and complete MOOCs. What Kizilcec and colleagues called the global achievement gap might result from issues related to language, technology availability, and less formal education.

This list of potential reasons for uneven MOOC participation and achievement could be broadened by instructional design factors. The TELMOOC design rests on principles of social learning theory and offers MOOC participants the opportunity for communal social identity, even though the learning community existence will be brief. This follows the suggestion by Kizilcec et al. (2017) that

[m]embers of LDCs may suffer from the cognitive burden of wrestling with feeling unwelcome while trying to learn and, therefore, underperform. This can be exacerbated by social identity threat, which is the fear of being seen as less capable because of one’s group. (p. 252)

Participant characteristics and education background are critical considerations for MOOC design and delivery. Although MOOCs offer open admission free of charge to anyone with interest in the topic, general interest is sometimes not enough to support learning. Appropriate learning design for the diverse populations interested in such opportunities must be addressed. Without this, the inequity and lack of access already present in education opportunities will continue to exist. As MOOC participation expands, so too does diversity of both participants’ backgrounds and their education contexts. MOOC evaluation must expand in response. A wider stakeholder review of the state of MOOC evaluation is needed (Douglas et al., 2019; Patru & Balaji, 2016).

Participant Information and MOOC Design

Taken seriously in TELMOOC design and delivery is the need to understand one's audience. The needs assessment step in distance education instructional design practice is well documented and long standing (Durak & Ataizi, 2016). Large participant numbers are a central MOOC goal. This goal makes it unlikely that designers might understand participating learner characteristics. The characteristics of people in countries with the greatest need for education development have much to gain through MOOC opportunities. However, assumptions about learning readiness and technological competence must be made carefully.

Hailed by many as a solution for the developing world's lack of access to education because MOOCs can provide learning opportunities to a massive number of learners from anywhere... close consideration of the ability of learners from most developing countries to make use of MOOCs seems to contradict this rhetoric. (Liyanagunawardena et al., 2013, p. 38)

Assessing what is a complicated set of conditions, such as access to technology, spoken and written language, and literacy level, can be key requirements for a contextual assessment that identifies the needs of the participating MOOC audience.

TELMOOC offerings include design principles that attempt to remedy these conditions. Low bandwidth and mobile phone delivery options are prioritised, and open access learning materials with Creative Commons licensing are a first choice. Language comprehension is supported through multi-modal content delivery via audio, video, text transcripts, and pacing. In addition, just-in-time review of participant characteristics is available from registration data. TELMOOC participants provide demographic information upon registration and again in more detail in the welcome survey. TELMOOC instructors and facilitators review and discuss participant characteristics throughout the MOOC delivery. Where possible, pedagogical processes are adjusted to enhance engagement and support participant learning opportunities.

To reiterate, an audience assessment is a central principle of any activity design. In distance education course design, learner review and assessment can occur prior, during, and after course delivery. In large-scale, high-enrolment courses, this kind of assessment and generalisation is difficult. To replace this, three learning design imperatives must be put in place. To realise the dream of educating the masses by engaging those impoverished financially and educationally, MOOC registrants should be identified as needing learner development at the front of a course. First, MOOC participants must be made aware of the importance of setting their own objectives for learning. Second, an exercise that compares and synthesizes personal learning objectives with identified course outcomes will provide awareness and purpose for learners. Finally, and most importantly, course activities must be wide ranging to provide multiple pedagogical processes that meet multiple needs. This allows more or less engagement and effort as desired by the learners, but still supports the mastery of all knowledge and skill as required. For

example, some MOOCs open all course modules and assignment directions on the first day of class. Participants are free to complete all modules and assignments independently and at their own pace. Although interaction, collaboration, and group activities may be offered, an independent, self-paced process is available if participants choose this.

Lambert's (2020) research offered findings that, like our experience with the TELMOOC, are in contrast to the prevailing literature. Increasing numbers of MOOCs with participants of many language backgrounds, and non-English MOOCs, are now available. Many are focused on regional issues or make an effort to remedy local inequities. Lambert identified two things addressed in the design of the TELMOOC experience. First, whether learning materials are closed by copyright or openly licensed matters in reference to cost and access. Second, "intentional and collaborative design for disadvantaged cohorts, including the provision of digital or face-to-face personal support" (2020, p. 1) mattered most. The TELMOOC offers collaborative learning assignments and community development according to the requirements of a CoI (Cleveland-Innes, 2019). MOOCs specifically marketed and designed to widen participation offer an alternative to historically designed or commercial high-enrolment online courses.

The TELMOOC was designed bearing in mind the imperatives outlined above, with a particular view to supporting those engaged in the global education enterprise. The course does proceed without individualised tutor support normally available in distance education. Active pedagogical processes and communal engagement offer support for peer and self-motivation. Like Milligan and Littlejohn (2017), we note that those engaged in professional careers see the benefit of MOOCs for their current roles and future career developments. This occurs alongside broader intentions of general interest or a desire to learn. It appears that an appropriately designed MOOC is an increasingly popular mechanism for professionals wishing to address current and future learning and professional development needs. See Chapter 7 for further discussion about this topic.

TELMOOC Participant Data

Identified countries

Based on information presented in the World Atlas (2022), there are 195 recognised countries in the world. TELMOOC participants have identified themselves as living, working, and/or being from 132 of those 195 countries. This large number of countries speaks to the widespread heterogeneity of the TELMOOC population, across multiple sessions. Most countries individually represent a small percentage of the total TELMOOC population. Figure 3.1 presents the top 20 countries represented in TELMOOCs 1–10. All of these are Commonwealth countries, indicating that the TELMOOC reached the intended target.

During the registration process and in the welcome surveys, TELMOOC participants are asked to identify their country. Although the TELMOOC has reached a wide range of participants in 132 countries, India, Bangladesh, Rwanda, and Fiji

provided the largest numbers of participants. Across all ten offerings, the TELMOOC has reached all Member States of the Commonwealth.

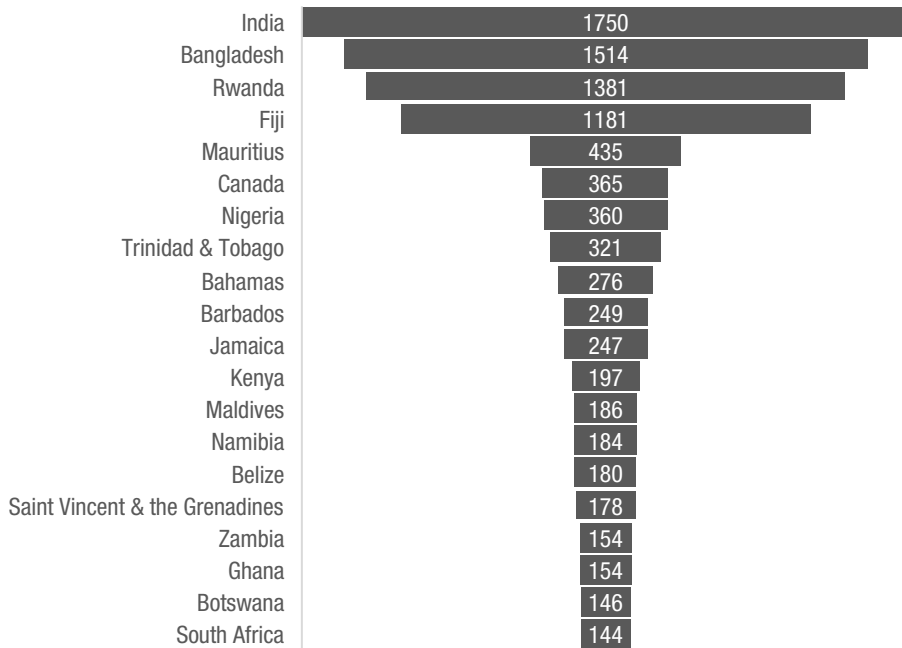


Figure 3.1. Top 20 participant countries.

Age

Across all sessions, TELMOOC participants' ages were broadly distributed in a shape that approximates a normal curve. Very few participants were younger than 20 (1%), while 9% were 55 or older. Participants years old made up 14% of the total. The age group years old made up 36% of the total, and years old, a slightly larger age range, was a larger percentage at 40%. Variation in participant characteristics across the ten different course offerings was quite small. With 50% of pre-registrants aged 40 or above, TEL 10 included an older age group than TEL 9 (in which 35% were 40 or above), reversing a trend towards younger participants seen in the previous four offerings. The age distributions of participants in individual offerings of the TELMOOC can be found in the individual reports [available at http://oasis.col.org](http://oasis.col.org).

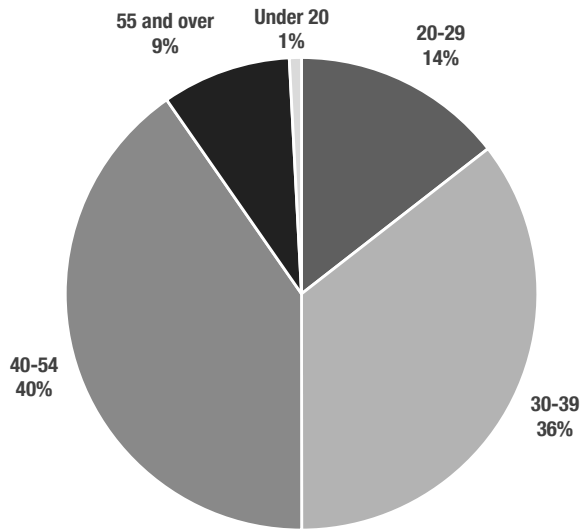


Figure 3.2. Age of participants.

Gender

In the combined TELMOOC data set, female participants at 54% outnumbered male participants at 46% by 8%. Across all TELMOOC sessions, females outnumbered male participants six times out of ten. However, the difference between male and female participants in any given instance was less than 10%.

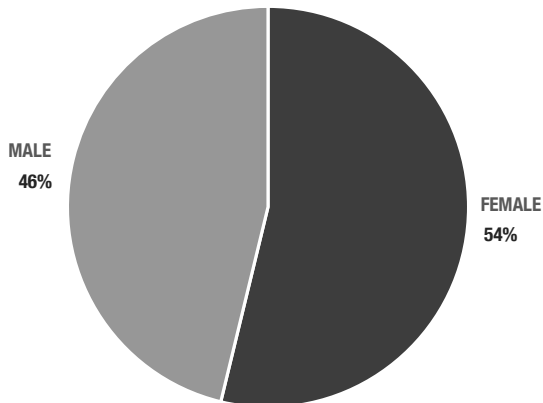


Figure 3.3. Gender of participants.

Education attainment

While widely distributed geographically in ways that include many countries that could be described as less well developed, TELMOOC registrants and participants still fit the pattern of highly educated participants. Doctoral and post-graduate participants combined reached a total of 56%. Another 32% reported having a college degree or a bachelor's degree, reaching a total of 88% of participants having formal higher education credentials. Another 12% reported high school, vocational training, or other levels of education. The TELMOOC reached those already well educated but from geographic areas that may require further education development to enhance inclusion, equity, and accessibility.

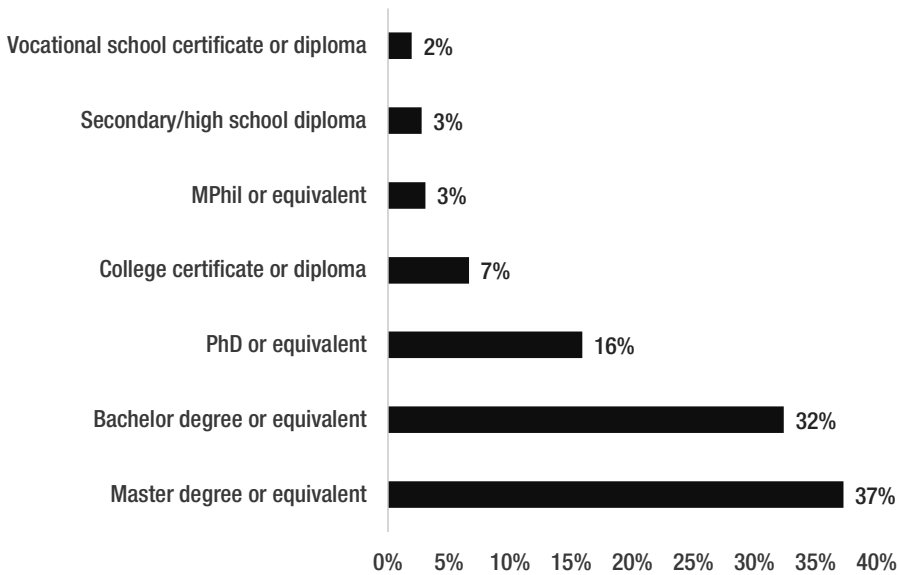


Figure 3.4. Education level of participants

Conclusion

Original MOOC design and delivery freely offered content-focused access to advanced knowledge with little reference to pedagogy or student-led, socially constructed knowledge creation opportunities to anyone interested. It appeared in early versions of MOOC design that content sharing was the imperative, and individual participant “success” was not defined or thoughtfully considered. TELMOOC offerings, on the other hand, are designed with a particular participant market in mind and a view to supporting a collaborative teaching and learning experience that includes participants of widely diverse backgrounds. While customisation for individual learners was not possible, the learning environment was created to support learner engagement and self-direction through multi-modal learning activities and short-term community development. Like the work done by Zhang et al. (2019), research into the TELMOOC sessions measured demographic characteristics and completion, with a view to adjusting design and delivery to support as many participants to completion as possible. Group work and collaboration, as identified by these researchers, is also encouraged in the TELMOOC. Chapter 5 reports completion data and correlates for all ten TELMOOC sessions.

Learner Engagement

Considerable research has evolved over the past decade with regards to MOOCs and learner engagement. Almost since their inception, MOOCs have garnered considerable criticism relating to their pedagogical approach (particularly with the xMOOC or instructivist MOOCs), high dropout rates, and lack of quality instructional design (Atiaja & Proenza, 2016). Regardless of their perceived inadequacies, MOOCs have been able to provide millions of learners with access to information and coursework that would otherwise be unavailable to them. With the global shortage of higher education spaces continuing to rise as economies become more and more digitally connected, the availability of learning with anytime, anywhere access has become increasingly important, especially for developing countries. In particular, the open access element of MOOCs has been able to provide learners around the globe with digital access to expert academics and researchers. As most MOOCs are developed and delivered by universities and are, for the most part, accessed at no cost to learners, financing the delivery of MOOCs is at the root of one of the most challenging problems: delivery of online education at scale with limited funding. MOOCs' ability to provide learning at a scale previously unheard of (sometimes with learners in a course being over 150,000) is what makes them very difficult to finance. So while universities have taken up the challenge of developing MOOCs and providing access to them at no cost to learners, there is a significant cost to the quality of the learning provided. In this chapter, we will explore how a MOOC was designed that focused on the provision of quality online learning, despite the scale of the learner cohort. Learner engagement is at the centre of this design and, as such, bears further investigation.

In looking at the specifics in relation to the challenges of MOOCs, Atiaja & Proenza (2016) summarised several of the significant flaws reported in the MOOC literature as being related directly to interaction:

- lack of personal contact between the participants in the teaching–learning process
- poor monitoring, as the methodology itself is designed so that monitoring by a teacher is kept to a minimum
- high dropout rates caused by a lack of motivation, monitoring, and mentoring, due to the large scale of the courses
- the teacher not effectively fulfilling their role as facilitator and not establishing a learning environment where they discuss, interact and collaborate with students. (p. 73)

We contend that these criticisms are, in fact, all elements of student or learner engagement, and that with quality online design and quality teaching, most of these criticisms can be diminished. Let us start with a more precise look at what we mean by engagement in learning.

According to the Great Schools Partnership (2016), the term student engagement in education

refers to the degree of attention, curiosity, interest, optimism, and passion that students show when they are learning or being taught, which extends to the level of motivation they have to learn and progress in their education. Generally speaking, the concept of “student engagement” is predicated on the belief that learning improves when students are inquisitive, interested, or inspired, and that learning tends to suffer when students are bored, dispassionate, disaffected, or otherwise “disengaged.”

In education, many view student engagement as the one of the key responsibilities of the teacher. Master teachers are often described by their keen ability to inspire students as well as keep them interested and motivated while they are learning. When we consider face-to-face education or classroom education settings, interactions are more visible and are real-time or synchronous in nature. Learners and teachers are present in the classroom and engaging with the topic being studied in a myriad of ways, almost all of which are related to the classroom or group of individuals in the room. In the case of online learning, all of these interactions that keep students engaged are not “present” in the same way, hence the significant challenge to then provide meaningful engagement at the scale of MOOC course deliveries.

A second but more generic definition of learner engagement is “a measure that reflects the quantity and quality of a learner’s participation in their courses and every other aspect of their educational program” (TalentLMS, n.d.). In other words, engagement is directly related to the amount and type of learner interactions in a course of study.

Learner engagement incorporates all aspects of a learner’s interaction, including co-operation with co-learners and instructors. In other words, learner engagement is directly linked to the interactions that learners experience during the course or education activity. As with the previous definition of engagement, the focus on interaction between learner(s) and teacher is the significant element. The challenge in online learning, where many of the interactions between learners and

teachers have been replaced, is: in what ways can quality learning be supported if so much of it relies on human interaction?

Prior to the development of the CoI model, three modes of interactions were identified in distance online or e-learning courses (Anderson & Garrison, 1998; Moore, 1989). This work (Figure 4.1) described three types of interactions that can occur in network-mediated learning (online learning) that contribute to *meaningful learning*: student–teacher, student–student, and student–content interactions. According to Anderson and Garrison (1998):

In the educational context, meaningful and worthwhile learning goes beyond simply accessing information and control. Increasingly the issue is the quality of the learning experience — the ability to critically judge information and construct knowledge and action. The independence and isolation characteristic of the industrial era of distance education is being challenged by the collaborative approaches to learning made possible by learning networks. (p. 100)

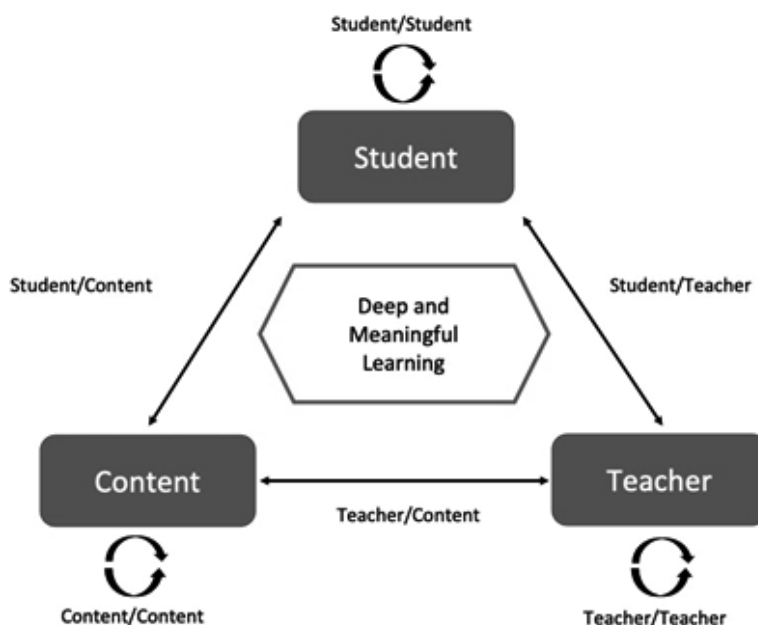


Figure 4.1. Modes of interaction in distance education (Anderson & Garrison, 1998).

Anderson and Garrison pointed to the significant change that networked or online learning brings with it in regard to the responsibilities of the teacher. Teachers are responsible for the design of interaction and thus engagement in the learning. Most teachers, while capable of face-to-face design and delivery of education, have not even been exposed to the design elements of quality online learning. But while there is a change in what teachers are responsible for when we consider MOOCs, Anderson and Garrison (1998) noted there is also a new responsibility placed on learners, as

educational theory is shifting to a collaborative constructivist conception of learning. This orientation recognizes that shared control is the prerequisite for a learner to assume responsibility to construct meaning. Responsibility “suggests an obligation for purposeful unconstrained participation of the individual in creating meaning... through the critical analysis and integration of new ideas/values” (Garrison, 1993, p. 36). Responsibility is a key issue in a collaborative constructivist perspective of teaching and learning. (p. 100)

Subsequent work by Anderson (2003) articulating the equivalency of interaction theorem provided a roadmap for teachers (as designers) trying to make decisions about which type of interactions to focus on providing to ensure quality learning.

Deep and meaningful formal learning is supported as long as one of the three forms of interaction (student-teacher, student-student, student-content) is at a high level. The other two may be offered at minimal levels, or even eliminated, without degrading the educational experience. High levels of more than one of these three modes will likely provide a more satisfying educational experience, though these experiences may not be as cost or time effective as less interactive learning sequences. (Anderson, 2003)

To summarise thus far, it appears that the *design and delivery* of quality MOOC learning experiences comes down to making decisions about when, where, and what kind of interactions learners need to be able to meaningfully engage in. The following segment describes how the TELMOOC design and delivery team addressed three modes of interaction (Anderson & Garrison, 1998) that relate directly to student engagement: learner–content, learner–learner, and learner–teacher interactions. In addition, we present an analysis of data collected from seven TELMOOC deliveries that provide answers to three research questions in this chapter. These three research questions provide insight to how the TELMOOC design and delivery was perceived by learners:

1. What did learners believe was the value of the course content?
2. What role did the instructional team play in the engagement of learners?
3. How did the discussions between learners support the continued engagement and contextualisation of information presented for other learners?

Student–Content Interaction

According to Anderson and Garrison (1998), learners are in greater personal control of student interaction with content in an online environment than in a classroom setting. We view this ability to personalise a course as one of the key affordances of online learning as compared to face-to-face education. While traditional classroom education may have direct interaction between learners and opportunities for immediate feedback and engagement, online learning has several other advantages. The “no significant difference” research comparing face-to-face and online learning points out several areas where online learning provides opportunities that do not exist in classrooms. One of these is based on the asynchronous

element of online learning, where interaction with content — whether prepared directly by the instructor or shared by other learners — is possible at a time, and over time that is appropriate for the learner. Nguyen (2015) in a discussion of positive research findings relating to this time aspect of online learning reported that online assignments gave students “time to think and reflect about the materials better than the traditional lectures” (p. 311), which in turn led them to understand the ideas more thoroughly. This learner control of interaction with content is one of the ways in which online learning allows for personalising of course material by the learner.

Bates (2015) pointed out another aspect of online learning that further supports the personalising of the learner–content interaction, in his discussion of multimedia use in the presentation of content:

A large part of learning requires the mental integration of content acquired through different media and symbol systems. For this reason, deeper understanding of a concept or an idea is often the result of the integration of content derived from a variety of media sources. (p. 371)

In order to enable learners to personalise (make the most personal meaning out of a course experience) an online course, it is important for instructors to provide a wide variety of media types. Not only does this allow for learners to interact with the content in a way that is most meaningful to them, but it also considers that diverse learners have different levels of digital access. While some learners have continuous Wi-Fi access, other learners will not have digital data access that can support real-time video playback. As described previously in Chapter 1, TEL-MOOC learners have a wide range of types and stability of digital bandwidths as well as types of devices with which to interact with the course materials. Furthermore, Bates (2015) highlighted that multimedia provision supports deep learning:

Media also differ in their ability to handle concrete or abstract knowledge. Abstract knowledge is handled primarily through language. While all media can handle language, either in written or spoken form, media vary in their ability to represent concrete knowledge.... Well-designed media can help learners move from the concrete to the abstract and back again, once more leading to deeper understanding. (p. 371)

Multimedia, then, is a second way in which quality online learning can allow for learners to personalise the content of a course.

The third way in which online learning provides unique learner–content interaction is the organisation of content in ways that support the learning. The father of modern education, John Dewey, in *Experience and Education* (1938–39) stated that a key role of educators is to arrange the conditions that provide the subject matter or content for experiences that satisfy the learner’s needs and develop their capacities. Based on Dewey’s work, the practical inquiry model was developed by Garrison et al. (2001) as a third element of the puzzle of technology-mediated learning (the other two elements being the community of inquiry and modes of interaction models). The practical inquiry (PI) model describes the sequence of events that occur when new concepts or ideas are presented to learners.

The PI model can be used to develop appropriate activity sequences for learning. This is one example of how the model could be used to develop an activity:

1. Triggering events – What were important questions identified?
2. Exploration – What opportunities and challenges were discussed?
3. Integration – What recommendations and conclusions can you draw from the discussion?
4. Resolution/application – How can we apply the *lessons learned*? (Garrison et al., 2001)

The TELMOOC design team strived to create meaningful sequences that learners could progress through during the course and personally contextualise for their own particular educational setting. In the next segment, we will take a closer look at how the TELMOOC is an example of quality learner–content interaction by examining our instructional design, and particularly the elements of personalised and flexible access to content.

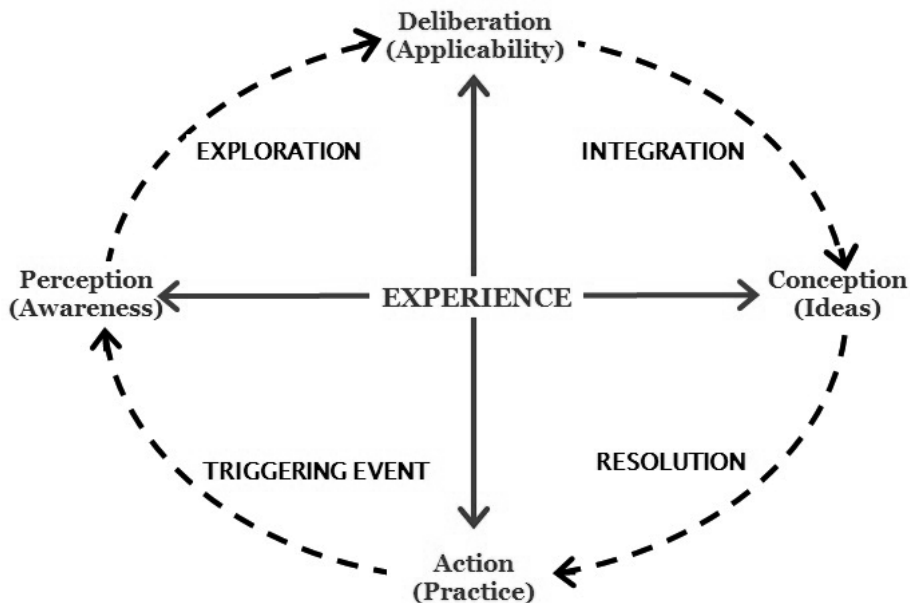


Figure 4.2. Practical inquiry model.

Learner–content interactions within the TELMOOC course provide the engagement that the CoI describes as cognitive presence. In a more practical sense, quality online education design provides structures and scaffolding of resources into simple, repeatable activity sequences within a course structure. This is particularly important for MOOCs, where learners are often new to the delivery platform or even online learning in general. The TELMOOC design team, composed of media, technology, pedagogy, and instructional design experts, spent considerable effort integrating evidence-based practices to create a course structure that met these criteria. The outcome of the design team’s collaboration was an activity sequence that presented the content of the course in a variety of media formats: video files, audio files, transcripts, PDFs, hyperlinks to external content, discussion forums and live interactive online presentations. The resulting activity

sequence was made familiar to learners in the first week of the course and continued throughout the delivery.

Before we go further, we need to review the overall structure of the TELMOOC. The course is divided into five weeks of course content, with each of the weeks being further divided into activity sequences that repeat. Figure 4.3 provides an overview of the course organisation, and Table 4.1 provides a detailed list of the courses, activities, and assessments in the course.

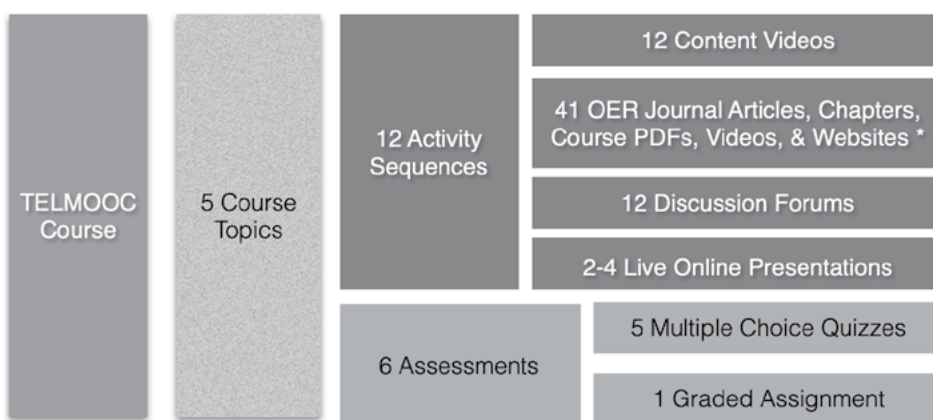


Figure 4.3. TELMOOC content organisation.

Table 4.1. TELMOOC topics and activity sequences

Week	Course Topic	Activity Sequences	Assessments
1	Models of TEL	Activity 1.1: The Community of Inquiry Activity 1.2: TPACK and TIM Activity 1.1: On Teaching Presence	1 multiple-choice quiz
2	Technology in Education	Activity 2.1: Integrating Technology in Education Activity 2.2: Benefits of Technology in Education	1 multiple-choice quiz
3	Open Educational Resources	Activity 3.1: Understanding OER Activity 3.2: Types of Open Licences Activity 3.1: Finding OER	1 multiple-choice quiz
4	Application of Technology	Activity 4.1: Practical Application of Technology Activity 4.2: Getting Help with Technology	1 multiple-choice quiz
5	Creating TEL	Activity 5.1: Creating Technology-Enabled Learning	1 multiple-choice quiz, 1 graded assessment

To structure content interactions in meaningful ways, each of the activity sequences followed a similar pattern of learner engagement. This learner engagement pattern incorporated the following active learning components that compose

a highquality cognitive presence experience, as described in Garrison et al.'s (2001) practical inquiry model:

1. View
2. Read
3. Review
4. Explore
5. Assess your learning
6. Respond

As learners progressed through the TELMOOC course, they were provided with a repeatable organisation and learner–content interaction experience. An in-depth look at how one of the activity sequences was designed is presented in Table 4.2 as an example for other designers who wish to follow it.

Table 4.2. Topic 1.2 activity sequence

Topic 1.2	TPACK and TIM	Media	PI Stage	Example of Course Content
View	View an introductory video segment presenting content covered in the activity	Video, audio, transcript	Triggering	Two models: TPACK and TIM instructional presentation Dr Martha Cleveland-Innes (5:15 minute video hosted on YouTube and within the course platform)
Read	Read supporting article or document	Online documents, material on websites	Exploration	Review the two sites below to learn more about TPACK and TIM.
Review	Review supporting article or document	Hyperlinks to online tools, videos, documents, websites	Exploration	Identify two technology applications you would like to use in your own classroom. You can include these in your posts in the lesson discussion forum on the next page.
Explore	Explore additional materials (video, resources)	Hyperlinks to videos, documents, websites	Integration	There are many ways to think about technology. The video below reviews the definition of technology and how it applies in education. Ask yourself what technology you currently use and why you might want to change it.
Assess your learning	Reflect on what you have learned with respect to the models presented this week	Technology tool available to the learner	Integration	Create a list in your own notes of three to five bullet points of ideas or applications you've learned this week and want to remember.
Respond	Respond and consider others' responses to a reflective question	Discussion forum	Resolution	Now continue on to the next page, the lesson discussion forum, to discuss the two models and how you might use them in your own application of technology.

In summary, opportunities for learners to be exposed to both content and access to high-quality curated OER presented in a repeating sequence are what the TELMOOC design team worked towards implementing. This is what the authors believe creates a strong foundation for establishing cognitive presence that supports deep and authentic learning. Before moving on to our discussion of the learner–teacher interaction, we will take a look at how learners in the TELMOOC perceived the learner–content interactions.

The research question guiding this analysis is: *What did learners believe was the value of the course content?*

As part of the TELMOOC final week, we asked learners whether they would consider completing an exit survey. The survey included a series of questions that were directly related to the learning experiences in the TELMOOC. This survey was approved by the ethics board of AU and complied with all the requirements of such an approval, including informed consent. Survey participants who provided consent for this exit survey (presented on the first page of the survey) completed a series of questions, some of which were directly related to the learner–content interactions in the TELMOOC.

Learners were asked to provide feedback by indicating their level of agreement with statements using a Likert-scale response: strongly disagree, disagree, neutral, agree, strongly agree.

The first relevant survey question asked learners to response to the statement: “The course material was of good quality.” There were 1,856 replies to this question, of which 92.6% agreed or strongly agreed that the course material was of good quality (see Figure 4.4).

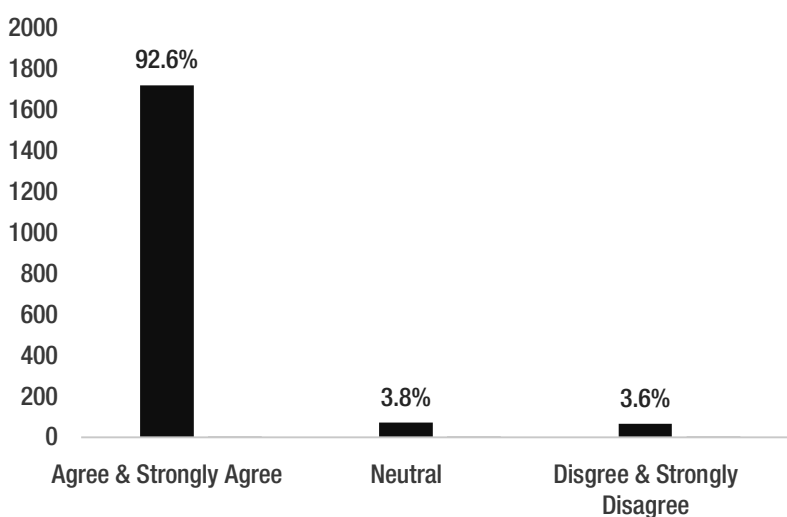


Figure 4.4. Good-quality materials.

The second relevant survey question asked learners to respond to the statement: “The course activities did a good job of holding my interest.” There were 1853 replies to this question of which 90.1% agreed or strongly agreed that the course material did a good job of holding their interest (see Figure 4.5).

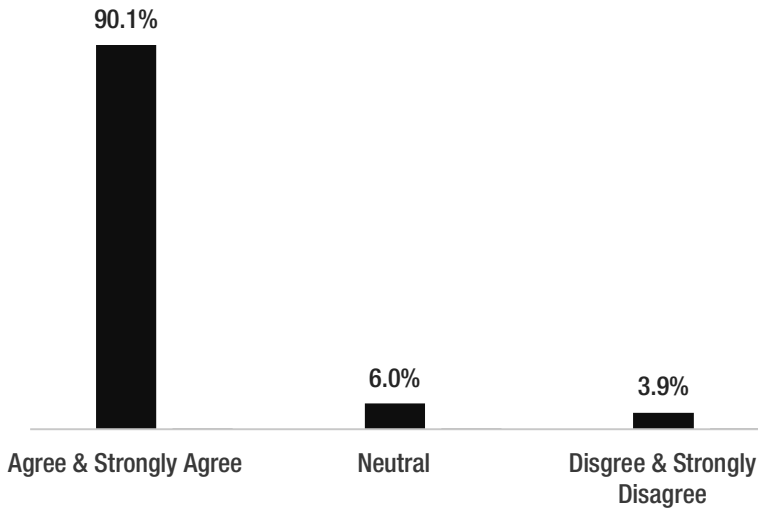


Figure 4.5. Activities held interest.

The third relevant survey question asked learners to respond to the statement: “The course activities reinforced the course material.” There were 1,854 replies to this question, of which 91.0% agreed or strongly agreed that the course material did a good job of holding their interest (see Figure 4.6).

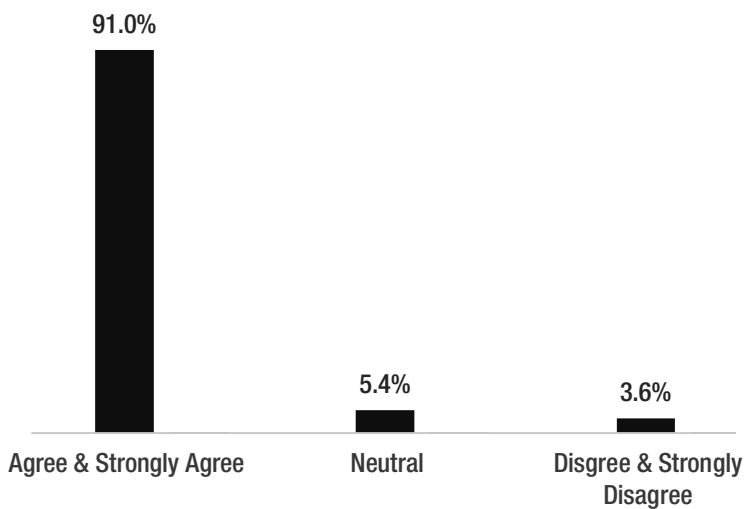


Figure 4.6. Course activities reinforced materials.

The analysis of these three survey questions makes it clear that learners were very satisfied with the selection of course materials and subsequent activities that engaged them with the content outlined in the TELMOOC. Further feedback from learners that supports this finding (as well as elaborates on it) can be found in the following quotes directly from TELMOOC learners, gathered in an open-ended feedback question of the exit survey. The first two quotes speak to the quality of the course content:

Overall I enjoyed the course. I liked that everything was straight forward. There never was any confusion on assignment, recording, slides, videos, discussion forums, which are always a plus with online courses. Especially I liked the assignment that connected the subject matter to relevant. I learned more. Thank you so much.

The course was highly informative and engaging. I found the course content and lecture videos very much helpful to enhance my e-Teaching skills as well as digital competencies. [O]verall very satisfied with course. Thank you COL. Thank you TELMOOC.

Other learners spoke directly to the organisation and structure of the course activities in addition to the content:

It was a very well-structured course. The flow of work was efficient from one week to the other; it built each time. In my opinion, the best of all is the connection it provided us with, to a wealth of resources on the issue of Technology-enabled learning. I am very glad I participated. Thank you!

The videos provided the information and the READ EXPLORE REFLECT... provided great opportunities to expand and enrich my understanding and interest. This was a great layout for the course.

The course was very well organized. The materials and videos were helpful in reinforcing learning. I indeed gained a lot of knowledge that I am going to put into practice especially when we are now being encouraged to develop out teaching materials and adapt them for online learning. Thank you [to] the organizers of the course. I will be enrolling for more course[s].

We can conclude from this snapshot analysis of how TELMOOC learners perceived the learner–content interactions that the course design and resources met the high-quality measure. While the design team worked towards this goal, feedback from a very diverse and international cohort of learners acknowledges their work further. Now, let us continue our exploration of the second type of interaction that engages learners in the TELMOOC, the learner–teacher interaction.

Learner–Teacher Interaction

With quality resources and design, the TELMOOC content was in place. So now what? In this next section, we will explore the intentional learner–teacher interactions. This is where the education delivery team became involved in

facilitating learning in a more direct manner. In a traditional face-to-face setting with a sage-on-the-stage approach to teaching, interactions between student and teacher are more about information transfer. The educator has the information students need to learn and presents it over a period of time during the course. In online learning, however, the content is made available to the learner to access when, how, and on what device they choose. In the online space, and particularly in a MOOC where the student-to-teacher ratio is very high, the role of the educator changes significantly. As described in Chapter 1, the iMOOC design presents a unique approach to scaling student–teacher interactions. The iMOOC utilises three distinct levels of instructor support: direct instruction, inspiration, and facilitation. The content videos presented at the beginning of each of the 12 activities are what constitute the direct instruction level of instructor support — and those content segments have already been discussed. But one element of the direct instruction — the synchronous online presentations — plays an important role in the learner–teacher interactions. After the first delivery of the TELMOOC, a series of synchronous sessions were added due to learner requests for more interaction with the instructors. Using Adobe Connect, two to four synchronous sessions were included as part of the direct instruction, in which a 30-minute lecture on the weekly course topic and 30 minutes of Q&A were offered. Challenges with bandwidth and devices made the Q&A element move to the chat function of the platform, but many learners were able to ask questions and add their context or experiences to the conversation. Analysis of attendees at these synchronous sessions suggests that learners who attended these synchronous sessions were more likely to complete the course and receive a TELMOOC certificate than those who did not attend. Two learners provided comments about the value of these sessions:

Thank you Telmooc teaching team and for your live sessions that enhanced our view of thinking.... Thank you teachers for your precious time in enlightening our minds with various strategies known and unknown to us. Hope to see you'll somehow somewhere keep up with this work.

During the live sessions I appreciated... sharing of the additional linkages as participants asked questions. This was great added value.

As has been reported in a large meta-analysis of online learning effectiveness (Bernard et al., 2004), learners gained considerable value from being able to interact directly with the instructor. Bernard et al. (2004) stated that one of the key generalisations to be made from their study was that sufficient opportunities for both student–instructor and student–student communication are important for learner success. Most MOOCs do not present synchronous sessions as part of their delivery because of the time and cost to deliver; however, the TELMOOC instructor team — well versed in online education tools and delivery — made this part of the course activities. These synchronous sessions appear to have been quite significant for learners, as preliminary research into the learners who attend the synchronous sessions indicates that approximately 60% of learners who achieved TELMOOC completion certificates attended a synchronous session.

Let us now turn our attention to the other two instructor roles of inspiration and facilitation.

Inspirer Role

The inspirer role in the TELMOOC is intended to provide encouragement and a preview to the weekly activities and as such also is a key element of the teaching presence evident in the course. In Ostashewski et al. (2017), we described this inspirer role, which was filled by one of the TELMOOC instructors of record. The inspirer provides “a live presence via informal video and text announcements, discussion board posts, and email support, acknowledging and addressing notable content contributions and incourse activities by learners” (p. 432).

As has been noted by research in online learning (Hartnett, 2016; Hartnett, et al., 2011), motivation is a complex and multifaceted element of online learner interactions. Hartnett et al. (2011) pointed out that educators should be aware of the important role they play in learner motivation. They further point out:

Most importantly, the relevance and value of the task (e.g., online discussions) need to be clearly identified and linked to learning objectives to help learners understand how the activity can aid in the realization of personal goals, aspirations, and interests, both in the short and longer term. (p. 33)

The weekly inspirer videos were “on the spot” live recordings that included analogies, examples, and links to upcoming information. These videos were produced in a setting that allows the learner to view the inspirer in a casual situation, and the speaker uses a more personalised and less formal tone. Analysis of the TELMOOC 1 inspirer videos (see Figure 4.7) identifies examples of learner comments speaking about the value of the video segments. Another aspect of the inspirer role was that of course cuing — meaning alerting learners about important aspects of and timelines for their weekly course activities.







Details	Thumbnail	Student Feedback	Views (% via computer)	Average View Time (% of video)
W1 Summary (4:48) 2017-01-15 https://youtu.be/zZO6RfQpoU8		N/A	N/A	N/A
W2 Summary (3:56) 2017-01-22 https://youtu.be/r8cuq_ksU_8		“Thanks for bringing some snow (as well as knowledge into our teaching)”	N/A	N/A
W3 Summary (3:12) 2017-01-31 https://youtu.be/XsfioN7Mu4I		“Excellent summary of the lesson, Dr. Nathaniel!”	102 views (91.2%)	1:56 (61%)
W4 Summary (3:23) 2017-02-06 https://youtu.be/b_tC_IBuVYU		“Thank you for the nice summary!!”	93 views (92.4%)	1:55 (57%)
W5 Summary (3:12) 2017-02-12 https://youtu.be/VcStZbfVirI		2 YouTube likes	75 views (84%)	2:06 (58%)

Figure 4.7. Inspirer videos.

An example of an inspirer announcement — which was sent directly to learners' email addresses as part of the course settings — is provided in Figure 4.8.




Week 3 Inspiration & Live Session 2 Details

Dr. Nathaniel Ostaszewski, TELMOOC Inspirer

All Sections

Oct 21, 2020 at 1pm



We are now in Week 3 of the course which is focused on OERs or Open Education Resources.

Find my weekly video(s) on the Home Page of this TELMOOC course or using the [Videos Link](#).

During this week you will have opportunities to learn many ways that OERs can be assessed to determine their fit-for-purpose in your educational setting. In [Activity 3.2 Creative Commons licenses](#) (one of the licensing systems for OERs) are detailed so that you can be clear about what this common OER system allows.

This week we will also be hosting the 2nd Live Session - here are the details:

Live session 2: Dr Marti Cleveland-Innes 22 October 2020

Applying the Community of Inquiry: Multiple presences, multiple ways to be present
 8am Mountain, 11am Atlantic, 16:00 CET, 7:30pm IST
[When is this in my time zone?](#)

- [More information and a discussion around this session](#)

Feel free to bring all of your Col questions to our live session... the **Link for the live session will be posted in an announcement 2 hours prior to the session.**

We hope that you continue to engage with your peers in the discussion forums and our entire instructional team is excited about the interesting discussions and comments you are having - great to hear from so many of you. And if you have yet to post, we hope that before the end of the course you will be able to post several times and become eligible for the Certificate.

See you online!




Figure 4.8. Inspirer announcement in TELMOOC 7.

One learner pointed out the specific elements of the inspirer role in a comment posted in the exit survey:

The Inspirer was very beneficial. This moved the course from a monotonous slides and content to a feeling of being outdoors and visiting another place. Also beneficial was the linkages made by the Inspirer to the course. It deepened the perspectives.

Up to now, we have described and provided commentary on two of the three instructor roles in the iMOOC design implemented in the TELMOOC. The facilitator role is perhaps the most interesting role that we have described in previous TELMOOC research and one that we feel will contribute valuable guidance for educators in online and blended courses in the future.

Facilitation Role

As with the inspirer role, the role of facilitator in the TELMOOC has been previously articulated in publications by the authors of this book. We have described the role of the facilitator as “a dynamic presence designed to provide a sense of touch with all participants. Each Facilitator was responsible for: monitoring and facilitation of discussions across forums and topics started in the various video forums by learners from their homerooms” (Ostashewski et al., 2017, p. 33). The facilitator roles were paid positions filled by graduate students in distance education programmes at AU. As mentioned earlier, the TELMOOC delivery team included one facilitator for every 250 active students, as a ratio of 1:250 was identified as sufficient for sustaining learner engagement. This 1:250 ratio recognised that for every 1,000 enrolments in the TELMOOC, only about 250 learners were engaged in the course at any one time. The key actions conducted by the facilitators are a subject of research that will be published in the near future, but a preliminary review of what they do has articulated what their role is in the TELMOOC. Currently, we can describe the following eight separate actions embodied in the posts of the facilitators across several deliveries of the course:

1. *Clarification* of elements of the course, including activities, assignments, quizzes, etc.
2. *Community of Inquiry*: references made by facilitators explaining any part of the course that included information about the CoI.
3. *Connection* with other learners, of two kinds:
 - a. *Connection/Interaction*: connecting learners who have engaged in discourse relating to a similar topic of discussion but have not yet connected
 - b. *Connection/Affirmation*: providing links to learning content/resources (connecting to supplemental learning content/resources, for example)
4. *Inquiry*: prompting learners to engage in discourse regarding a topic or question.
5. *Instruction*: explaining the purpose of specific course work/activities.
6. *LMS/technical support*: navigational support to help learners with finding and accessing content, activities, and resources within the LMS.
7. *Reassurance*: commentary/dialogue/interaction that is meant to foster social presence.
8. *Technology integration*: reference to the assessment and integration of technology and its pedagogical impacts.

These actions of the facilitators were guided in several ways during the delivery of each TELMOOC. On a weekly basis during the TELMOOC deliveries, the instructional team of technical and administrative support, the inspirer, and the facilitators met online for one hour. Initially, the facilitators were given some instruction relating to what their tasks were to be, based on previously conducted research and practice with the iMOOC model (Cleveland-Innes et al., 2016). Strategies and techniques for doing this were developed during each TELMOOC, addressing specific differences in what was being observed in the discussion forums. Over time and with more experience behind the delivery team, it was decided that a significant portion of the facilitators’ work was to be focused on making

connections between learners in the TELMOOC. The reason for this decision originates in distance education practice and research on the CoI, including consideration of the iMOOC design as one that promotes inquiry as a community:

Facilitation exists as the central activity of teaching in an educational community of inquiry that emerges from the activity between students and instructor. Facilitative actions, on the part of both the students and the instructor, create the climate, support discourse, and monitor learning such that presence can emerge and inquiry occurs. In the act of facilitation learners connect to each other and the instructor, engage with the content, are cognitively present as intellectual agents, and carry out all actions central to the development and maintenance of the learning community. (Vaughan et al., 2013, p. 46)

Remember that in Chapter 1, we described the iMOOC design in detail and in that description highlighted that the TELMOOC experience exemplified quality online learning using a community of inquiry framework. Providing experiential learning about the CoI as a model for technology-enabled learning and having an opportunity to engage in a working community of inquiry were key goals of the course. The design team strongly believed that it was also very important for learners to see what the facilitation role looked like in order to provide replicable actions for learners to use in their own teaching practice.

To complete our review of the student–teacher interactions in the TELMOOC, we considered an analysis of three questions in the exit survey to share the learner perspective. The guiding research question for this analysis is: *What role did the instructional team play in the engagement of learners?*

As with the previous section, the following data collected in the exit survey were analysed. Of 1,520 learners who answered the following Likert scale question “I experienced direct instruction during TELMOOC,” 78.7% agreed or strongly agreed with the statement. Similarly, of 1,579 learners who answered the following Likert scale question, “My learning was supported through facilitation by the Inspirer,” 79.5% agreed or strongly agreed with the statement. And finally, of 1,572 learners who answered the following Likert scale question, “My learning was supported through facilitation by the roving facilitators,” 73.0 % agreed or strongly agreed with the statement.

Other commentary was collected that highlights the value learners placed on the TELMOOC delivery team:

Thank you to the instructors and facilitators for a wonderful experience. This MOOC exceeded my expectations with the information linking technology to pedagogy and the numerous resources shared. I truly enjoyed learning about the Community of Inquiry and the TIMS, OER and SECTIONS model. Bates’ work is interesting and an excellent read/resource. Thank you for this opportunity.

By themselves, these findings do not provide a detailed account of how the teaching team was perceived by all TELMOOC learners. Regardless, these findings do support the efforts of the instructional team and provide additional validation of the intended learner–teacher interactions. The reason these findings matter

and contribute to the online education field is related to high-quality MOOC delivery without the costs that would be required for a 1:30 teacher–student ratio. Furthermore, MOOCs provide us as researchers with an opportunity to explore various aspects of online course delivery in order to further the conversation about what quality online learning requires. Further descriptions of changes to the TELMOOC delivery that were made by the instructional team — such as the impact of pacing weekly module releases as opposed to releasing all the course materials at the beginning of the course — can be found on the COL’s Oasis website (<http://oasis.col.org>) by searching for “TEL MOOC”. These and other strategies for increasing completion rates and fine-tuning other aspects of the TELMOOC are presented in Chapter 5. Here, we move on to a more detailed look at the third and perhaps most meaningful type of interaction in the TELMOOC: learner–learner interaction.

Learner–Learner Interaction

Throughout much of the current education literature, the importance of learner–learner interactions is purported to be paramount. In the absence of any resources, learners can learn from each other, whether their interactions are structured as collaborative activities in a course or unstructured conversations between practitioners discussing solutions to individual problems. In the TELMOOC, the idea of learner–learner interaction being as important as the resources is keenly understood as a critical component of the success of the course for learners. Let us consider three different educational theories that are evident in technology-mediated learning designs, as a way of looking at the designed learner–learner interactions in the TELMOOC.

Modern *constructivist* educational theory based on the work of Lev Vygotsky contends that learners learn by constructing meaning and integrating it into existing knowledge constructs.

Learners are believed to be enculturated into their learning community and appropriate knowledge, based on their existent understanding, through their interaction with the immediate learning environment. Learning is thus considered to be a largely situation-specific and context-bound activity. (Liu & Matthews, 2005, p. 388)

Early in the history of computer-aided technology-enabled learning, Seymour Papert published his *constructionism* theory, stating that the construction of learning artifacts and the learner–learner discussions relating to those artifacts constitute another way to support deep learning.

Constructionism... shares constructivism’s connotation of learning as “building knowledge structures” irrespective of the circumstances of the learning. It then adds the idea that this happens especially felicitously in a context where the learner is consciously engaged in constructing a public entity, whether it’s a sand castle on the beach or a theory of the universe. (Papert, 1991, p. 1)

Most recently, *networked learning* was described by Goodyear et al. (2004) as a theory for the digital age that has implications for learners who are connected by networks. Networked learning is “learning in which information and communications technology (ICT) is used to promote connections: between one learner and other learners; between learners and tutors; between a learning community and its learning resources” (Goodyear et al., 2004, p. 1).

While all three of these theories vary considerably, they share a common element. The thread running through them all is that learning is co-constructed, whether between learners or between the learner and others. As such, designed learner–learner interactions should form a significant part of the learning activities that learners engage in. All three of these theories are evident in the TELMOOC design, particularly the activities and interactions that the TELMOOC design and delivery intend to create. Another important element of these three learning theories is their description of the learner as an active participant, rather than a passive one. This requires much more effort and self-regulation on behalf of the learner and is one challenge that many educators face when bringing these theories into practice. McConnell et al. (2012) make this point clear: “Networked learning places a high value on cooperation and collaboration in the learning process; self-determination; difference; trust; investment of self in the networked learning process; and the role technology plays in connecting and mediating” (p. 5).

The responsibility for learning and active participation in learning — actively seeking out and connecting with other online learners in a MOOC — is challenging. For example, the sheer volume of discussion posts and the time it takes for learners to find personally meaningful posts is often overwhelming. Despite this challenge, a critical element of the TELMOOC’s impact on learners is that they must be provided with opportunities for contextualising course content and topics with other learners. Ni (2013) pointed out in a study comparing online and face-to-face learning that online learning is “effective in potentially eliminating barriers while providing increased convenience, flexibility, currency of material, customized learning, and feedback over a traditional face-to-face” (p. 200). However, Ni further stated that that the “advantage of online interaction may not be realized if close connection among the learners is absent” (p. 201). This close connection between learners does not simply come into existence in any course, as the connections need to be encouraged by the instructor or instructional team. This is even more so in a MOOC course, where intentional interactions between learners are important for the instructional team to enable. So let us take a closer look at what the TELMOOC design and the instructional team did to foster the learner–learner connections we have described here as critical.

One of the first ways of fostering learner–learner connections is by introducing learners to each other at the start of a course. In the TELMOOC, this was done in the welcome forum. Shared experiences, locations, or challenges are important for learners to find out about each other and thereby be able to interact and engage with each other meaningfully. Here is an example of the TELMOOC welcome forum instructions:

Welcome to Introduction to Technology-Enabled Learning!

Take a moment now to tell the class a bit about yourself.

We have participants from around the world here, with different experiences, interests and goals. This forum is a chance to learn who you are sharing this course with and to take the first steps to build a learning community together.

This first post in the course does not have to be long, but good things to include are:

- *where you live,*
- *your professional role (for example, what you teach and at what level), and*
- *what you hope to learn from the course and from others in the class.*

When you have made your post and read through a few of the messages from your fellow participants, continue on to Week 1[Link].

The second way that learner–learner connections were fostered in the TEL-MOOC was directly by the instructional team during delivery of the course. Four specific activities of the team asked for learners to connect with each other in the discussion forums:

1. **Inspirer:** The inspirer highlighted the ability of learners to create their own forums on a topic or question in the weekly videos and/or the inspirer announcements they wished to address.
2. **Facilitators:** In all discussion forums, the facilitators encouraged learners to connect with other learners by telling them about a learner-created forum or topic discussion that was going on elsewhere, and as best as possible, providing a link to that forum. We discussed this previously in our explanation of the facilitators’ roles when we described one of their tasks as “connection with other learners.”
3. **Live sessions:** Prior to and after the live sessions, we asked learners to engage in a forum related to the topic of the live session. During the session (and in the recording), learner questions were answered then often continued in the discussion forum afterwards.
4. **Hot topics:** Learner- and facilitator-created forums were promoted as hot topics. In the early TELMOOC deliveries using the mooKIT platform, there were hundreds of learner-created forums, and so on a weekly basis, the instructional team provided a summary of some of the most popular/most posted-to forums so that other learners could easily connect to these. These were called hot topic forums, and the concept in later TELMOOCs was used as a facilitator-created and managed forum based on the repeating topics that learners were often wishing to engage with.

The importance of fostering learner–learner interactions is that the content of discussion forums is always being read by other participants. In these discussions, participants often share useful resources, ideas, and perspectives on the topic being discussed, providing excellent examples of the topic in learner contexts. On more than one occasion, the instructional team referred to discussion posts in

forums as some of the *content* of the MOOC. In this case, they meant that forum posts are often TELMOOC information that has been contextualised by a learner, and these posts provide considerable value for other learners to read. In a sense, this acknowledges the expertise learners bring to the course but also makes learner posts part of the *distributed teaching presence* that appears in the MOOC. This ties back to the previous discussion in this chapter about the roles and responsibilities of learners changing. Participating in the teaching presence is one of the new roles for learners, where learners themselves guide other learners. Paz and Pereira (2016) pointed this out:

We propose that when the participants in the learning community regulate each other's learning processes, mainly in group-work activities, they exert (distributed) Teaching Presence in a way not previously addressed by the CoI framework. If the learning and teaching roles are shared by the participants in the CoI, this dimension of Teaching Presence has a high probability of being distributed and have its source in other students. (p. 55)

Designing for and explicitly encouraging learners to take the initiative through sharing their solutions or experiences and providing some of the teaching presence is a key difference in the TELMOOC design. It is hoped that this description of why and how the TELMOOC sets up and supports learner–learner interactions will provide others with a roadmap when designing MOOCs or blended and on-line courses.

So exactly how successful was the TELMOOC team in providing the learner–learner interaction support? We look at a final research question in this chapter to provide some detail about the perceived value of the learner–learner interactions: *How did the discussions between learners support the continued engagement with and contextualisation of information presented for other learners?*

One survey question asked learners to response to the statement: “My learning about TEL was supported through my discussions with other students.” There were 1,853 replies to this question, of which 73.2% agreed or strongly agreed that their learning was supported by peer discussions (see Figure 4.9).

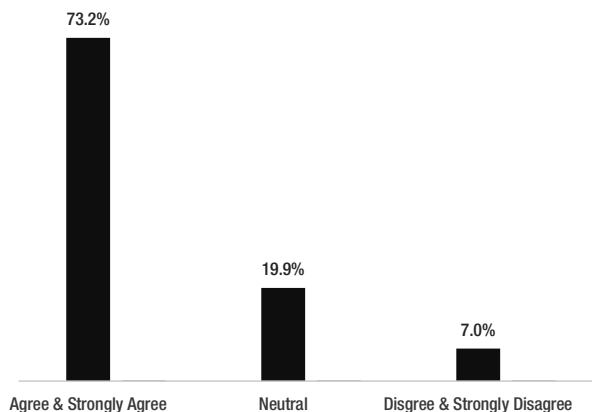


Figure 4.9. Learning was supported by peer discussions.

Another survey question asked learners to respond to the statement: “My learning about TEL was supported by reading other student posts.” There were 1,852 replies to this question, of which 80.9% agreed or strongly agreed that their learning was supported by peer discussions (see Figure 4.10).

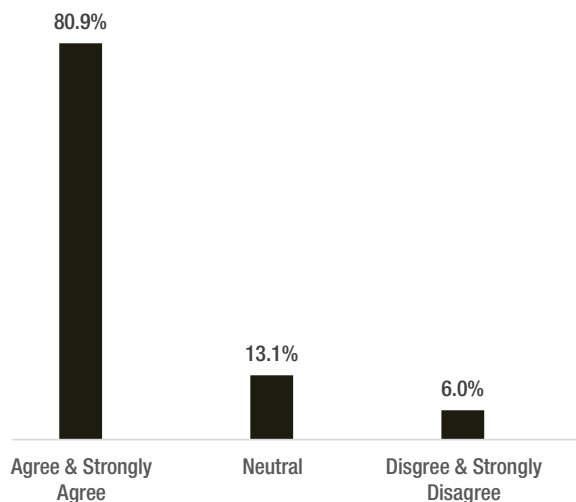


Figure 4.10. Learning was supported by reading peer posts.

What is interesting about the analysis of the data collected on these two questions is that there is an approximately 10% difference between them. While 73.2% of learners who responded indicated discussions were valuable, 80.9% of the same learners indicated reading others’ posts was more valuable. This supports the design intentions of the TELMOOC team, which we described earlier as learner posts being “content” or “content with context” for other learners. Regardless, there is considerable agreement from learners that engaging in discussions and reading posts have considerable value in the course. While these findings are not as high as the 92.6% of learners who indicated the course had good-quality content, they suggest that the discussions are almost as important as the content.

Conclusion

We began this chapter with a discussion about learner engagement, noting that engagement was connected to the “degree of attention, curiosity, interest, optimism, and passion that students show when they are learning or being taught” (Great Schools Partnership, 2014, para. 2). Secondly, we focused the chapter discussion around a framework of interaction using Anderson and Garrison’s (1998) modes of interaction in distance education model. Discussing the intended TELMOOC design and delivery in terms of learner–content, learner–teacher, and learner–learner interaction perspectives provided a roadmap for scalable quality MOOCs or online learning implementations. Considering constructivist, constructionist, and network learning theories as part of the underpinning of the TELMOOC guiding pedagogies, the community of inquiry is evident as the framework in which

these fill in the activities and actions of learners. Personalisation, access, flexibility, and a focus on interactions that are meaningful and worthwhile for learners has demonstrated that quality MOOCs are possible. We make this claim with confidence in that the TELMOOC's completion rates were three to five times higher across all of the ten TELMOOCs than other MOOC completion rates. Furthermore, the rapidly dropping engagement patterns described by Clow (2013) as a funnel were not evident in the TELMOOC. More discussion about the completion and engagement levels in the TELMOOC are in the following Chapter 5.

One final thought connects with the interaction equivalency theorem (Miyazoe & Anderson, 2014) as it relates to MOOCs. We believe that all three elements of interaction do in fact need to be present in sufficient amounts to ensure education quality. While some models of education design support the idea that costs and quality can be interchangeable, our iMOOC model provides an example where all interactions can be supported at scale without the enormous costs associated with quality online learning.

MOOC Completion

This chapter explores a topic that is currently one of the most challenging to both explain and resolve to the satisfaction of policy makers and funding providers: MOOC completion rates. While much has been made of the very low course completion rates in MOOCs, the concept has come under much debate since 2012, which was aptly described as the year of the MOOC (Trexler, 2020). Currently, MOOC completions have been reported as the number of certificates or successful learners in a course as compared to the number of course registrations. Unlike formal education, where registration is limited to the learners who have been admitted to an institution, MOOCs are basically open to global access. This open access to registration so significantly skews the number of registrants that there is no reason they should be used in the calculations of MOOC completions. Rather, MOOC registrations may represent the interest of the topic, reach of the institution, or marketing attached to a MOOC. Our hope is that the arguments we present in this chapter will help to change the conversation about how MOOC quality and success are considered and measured.

Our discussion begins with the research question guiding this chapter: *Are there other metrics that can better articulate the completion of MOOC objectives?* Using longitudinal data from ten TELMOOC deliveries, we present our argument for how MOOC completion numbers should be calculated in relation to existing formal education completion numbers.

Formal education course completion rates for both quality in-person (Thomas, 2002) and quality online learning (Moore & Fetzner, 2009) are in the 85–95% range, while MOOCs are in the 5–10% completion range (Watters, 2012). The assumption of policy makers and funding providers is that the low completion rates mean that MOOC course quality is quite low or questionable, at best (Aydin & Yazici, 2020). This has caused considerable critique of MOOCs, as some of the platforms, such

as Coursera and edX, were touted as the new solution to formal university course access. Low-quality courses would affect that outcome, as well as affect university reputations. MOOC supporters describe the low completion rates as not a problem at all (Vu & Fadde, 2014), as they are not related to the quality of courses, but rather to other aspects of MOOCs. Additional research suggests that MOOC completion rates should not be compared to traditional face-to-face classroom completion rates because MOOCs are designed for participant browsing (Sangrà et al., 2015; Snyder, 2012) and lifelong learning experiences. This chapter describes our approach to extending the discussion about MOOC success, moving it beyond simply counting certificates or completion numbers. We look at alternative ways of evaluating the success of a MOOC from research- and practice-based perspectives, having delivered 10 TELMOOC iterations over four years.

While many of the Ivy League universities originally hoped that MOOCs delivered on newly funded platforms such as edX and Coursera would take the place of university degree courses (Pence, 2012), this has not been the outcome after ten-plus years of the xMOOC hype. Rather, these platforms have now become for-profit organisations providing access to forms of online courses that resemble little of the original MOOCs in 2008–2010. They certainly do not fit the initial model of MOOCs as open access courses but are an extension of universities looking to market their institutions at scale. Furthermore, the goal of these platforms was to introduce a new type of micro-degree that they could monetise, but the uptake by employers has not been forthcoming (P. Shea, personal communication, February 21, 2022). University-length courses (often 13 weeks) provided on these platforms with extremely large-scale enrolments and minimal support systems for learners have indeed failed, as many academics predicted (Sangrà et al., 2015). Our view of MOOCs is that they should provide informal and lifelong learning opportunities for global learners to access high-quality education experiences (staying true to the open concepts of access and no fees). Professional development (PD) is one area in which MOOCs can excel, utilising innovative technology-enabled teaching and learning practices. This was noticed by Coursera in 2014, when one of the founders, Daphne Koller, spoke about who their learners are:

And what we're discovering is that our target audience by and large are continuing education learners, people who either have completed their education or in the case of some developing countries maybe never had access to education to begin with. They are now working adults and they are looking to make a better life for themselves, either by enhancing their career, in some cases just by expanding their minds. (Roberts, 2014)

Learners coming to these MOOCs are often middle-age, university-educated learners who appear to be looking to add to their professional knowledge base. And this is where the value of MOOCs is highest, providing access to high-quality open courses that support experienced learners anywhere in the world where there is digital data access. Some of the original cMOOCs created were exactly this type of PD experience yet were missing the structure and processes that could make them useable for learners who were not already familiar with online learning.

Since the original cMOOCs in 2008, online learning platforms, digital tools, and Internet access have evolved and expanded considerably around the globe. With current information technologies and digital devices, MOOCs can become global learning opportunities supporting a much wider range of learners. At the same time, the need for higher education institutions in countries with developing economies is staggering and demand continues to grow. Perhaps the most profound benefit MOOCs will offer is in countries without the capacity for large investments in brick-and-mortar infrastructure, or where large numbers of learners immediately need access to higher education. The scalability of MOOCs is what may make them able to provide part of the solution. Take, for example, India, which wants to increase its post-secondary completion rate from 13 to 30%. This would put it in line with where OECD (Organisation for Economic Co-operation and Development) countries are in terms of postsecondary education. However,

to do that, they are going to have to build 1500 academic institutions and train a million new instructors. Now, the point is, even in their *current* academic institutions, even in the very top ones, there is a lack of instructors. There is not enough to cover the classes that are already there. So, where are you going to get all those new ones? And so I think, if you want to solve this problem within this generation or even the next one, you are going to have to find an alternative mechanism for delivery of education in a more scalable way. (Roberts, 2014)

So regardless of the need, whether for access to formal education or to informal lifelong learning, MOOCs can provide movement towards meeting the informal and perhaps even the formal education needs of the expanding global population. The transformative role of education is understood by nations around the globe as key to a sustainable world and is seen as the key enabler of UN sustainable development goals (UNESCO, 2019). As open and distance education scholars, the goal of providing access to quality education experiences has guided our work in the past and will continue to do so as we keep working on MOOCs that develop education capacity around the world.

Calculating Accurate MOOC Completion Rates

Completion rates of courses have been one way in which institutions and policy makers of formal learning have been evaluating the quality of courses they provide (Thomas, 2002). While this metric may be sufficient for formal education offerings either online or face-to-face, MOOCs are not formal education. Initially, the MOOC (a connectivist or cMOOC) was first developed in 2008 as a way to engage a small group of 24 fee-paying students with a larger learner community on the Internet (Cleveland-Innes & Ostashewski, 2019). This first MOOC was created by George Siemens and Stephen Downes at the University of Manitoba, Canada as an online 12-week course titled *Connectivism and Connective Knowledge* (Schulze, 2014). By 2012, the Year of the MOOC (Pappano, 2012) had brought new excitement along with a new learning technology to the MOOC space — the eXtended MOOC or xMOOC. The xMOOC hype of providing access to university courses

and the marketing of universities who were presenting MOOCs quickly changed the landscape of what was considered open online education. Led by universities well known for their world-class location-based delivery, such as Stanford and MIT, much of the xMOOC design and delivery did not even reflect best practices in online and distance education. Regardless of pedagogy or purpose, these xMOOCs quickly set the stage for how MOOCs would be measured and evaluated — i.e., using course completion rates.

By this measure, at 20.2%, the TELMOOC already stands out as a MOOC with a higher completion rate when compared to the 5–15% reported (Jordan, 2022). However, this does not really tell the story of success that an external evaluation of the TELMOOC does (Perryman, 2019), nor does it represent the success we know the TELMOOC has relative to formal education settings where we have taught for many years. In Table 5.1, we present the cumulative data for TELMOOCs 1–10 to begin our discussion of active and fully active learners. This is the first point where we argue that MOOCs need to be measured in different ways. Current MOOC claims regarding completion rates are based on the number of registrants — regardless of whether or not they ever log into the course. There is no sound reason, that we are aware of, to calculate MOOC success using registration numbers for a course. MOOC reports should at a minimum be using *active learners* as the basis for their completion calculations. We define active learners as those who have signed into the course space at least one time. Coursera’s Daphne Koller made this same point about what MOOC registrations actually mean:

It’s important to realize that signing up, the enrolment numbers for any of these courses, is akin to putting a little x in the course catalog of your university saying, I might drop in on that class if I’m inclined. So half of the people who put that little x never even show up to the first lecture. (Roberts, 2014)

We agree and report that in line with Koller’s statement, 42% of TELMOOC registrants never even showed up in the course space, let alone to the first lecture. As mentioned earlier, MOOCs are open access and open registration, and as such, their potential learners are not limited to learners admitted to or attending a specific institution, as is the case with formal education completion calculations. Using active learners in the TELMOOC calculations (as presented in Table 5.1) represents the completion rate across ten TELMOOCs as 32.8%, with one completion rate reaching as high as 44%, of learners receiving a TELMOOC certificate of completion.

But our discussion about completion rate calculations does not stop there. When using a comparison to university education, *fully active participants* are the participants who stay in the course after the first short period of time. Again, Daphne Koller has explained:

Half of the ones [learners] that do realize after watching the first lecture that this [course] isn’t what they were looking for. They thought astrobiology was about UFOs (Unidentified Flying Objects) and it turned out that it’s not. And so, of the ones that, after a couple of weeks of what you might call a shopping period in a college, are declaring that they are committed to taking the class [remain to take the course]. (Roberts, 2014)

Table 5.1. TELMOOC certification rates

MOOC#	Registered	Active	Fully Active	Total Certificate	Certification Rate Using Registrations	Certification Rate Using Active	Certification Rate Using Fully Active
1	1,143	673	199	107	9.36%	15.90%	53.77%
2	3,381	2,561	1,125	696	20.59%	27.18%	61.87%
3	2,493	1,371	539	372	14.92%	27.13%	69.02%
4	2,425	1,867	911	685	28.25%	36.69%	75.19%
5	1,401	1,134	614	499	35.62%	44.00%	81.27%
6	1,668	1,184	575	446	26.74%	37.67%	77.57%
7	2,178	958	549	400	18.37%	41.75%	72.86%
8	2,443	977	480	330	13.51%	33.78%	68.75%
9	645	354	169	104	16.12%	29.38%	61.54%
10	471	226	113	70	14.86%	30.97%	61.95%
Totals	18,248	11,305	5,274	3,709	20.32%	32.8%	70.3%

We define *fully active learners* as those learners who log into the course and complete the first week of activities. In MOOCs, these activities are often discussion forum postings and a quiz completion. Learners who engage with the course materials and either contribute to discussion forums or complete the first quiz are what we would expect of fully active formal education learners. In the case of the TELMOOC, we have examined the number of learners who posted to a forum or attempted the week 1 quiz and found there were more quiz takers than posters. Therefore, we identify fully active learners for the TELMOOC as learners who attempted quiz 1. Fully active TELMOOC learners represent 28.9% of registrations (5,274 fully active learners out of 18,248 total registrations). We argue that the number of certificates awarded to fully active learners should be the number that is used to calculate the completion rate of a MOOC. Across ten TELMOOCs, a completion rate of 70.3% was achieved (3,709 certificates awarded to 5,274 full active learners).

We define our *fully active MOOC completion metric* simply as calculating MOOC completion rates as follows:

$$\frac{\text{number of certificates/passing grades assigned}}{\text{number of fully active participants}} = \text{MOOC completion metric}$$

This metric, we further believe, represents the best practice for reporting completions for all MOOCs.

Reporting of completion rates in formal university education programmes provides several comparisons that directly support the validity of our MOOC completion metric. These comparisons support our claim not only that ten TELMOOC deliveries had a 70.3% completion rate, but also that our metric is representative of

all MOOCs. The first of these comparisons comes from data presented by Daphne Koller, who reported that about 63% of Coursera learners who are fully active go on to complete the class (Roberts, 2014). A second comparison is with completion rates for university education. As we reported in Chapter 3, the education levels of TELMOOC participants, just as many other MOOC providers have reported, are quite high. Many studies have reported that a high proportion of MOOC learners (70%+) have at least an undergraduate degree (Liyana-gunawardena et al., 2015; Ruipérez-Valiente et al., 2020). Considering this high education level, university education programme completions should be a good comparison for the completion rates that MOOCs achieve. Murphy et al. (2007) reported that

Research on completion rates, based upon data provided by universities to DEST [the Department of Education, Science and Training], suggests that there is a considerable amount of attrition from the higher education sector. Martin, Maclachlan and Karmel (2001) analysed data on the 1992 and 1993 cohorts of commencing undergraduate students. By 1999, 63 per cent of the 1993 cohort had completed an award at the institution of commencement, 33 per cent had not completed an award and were not studying at the institution of commencement, and just over 4 per cent were still studying. The authors estimated final completion rates of 71 to 72 per cent for the two cohorts. (p. 2)

Another completion rate comparison for the TELMOOC and many other MOOCs is in relation to the percentage of MOOC participants with graduate degrees. In the TELMOOC, this was 57.5%, and research conducted by Ruipérez-Valiente et al. (2020) indicated that approximately 50% of MOOC learners across 12 different international MOOC platforms have graduate degrees. While there is a wide range in graduate degree programme completion rates, Jiranek (2010) reported that a national average in Australia was 47%, but that rates ranged from 20% to 63% across different programmes. Similarly, in 2017, AU, a fully online open university, reported graduate completion rates ranging from 55.1% to 71.4% across several programmes. These graduate rates lend additional credence to the metric we have articulated. Further research is needed into the application of our metric across other MOOC deliveries in the future.

While the original argument presented by MOOC detractors tried to indicate that online education in the form of MOOCs was considerably substandard, our closer examination reveals that MOOC completion rates are actually quite on par with those of formal university education delivery. In summary, we have outlined a process of MOOC completion rate calculations that can better articulate the completion of MOOC objectives. Identifying fully active learners in a MOOC as those who complete week 1 (or some similar subset of the course) provides a comparable number to that which is used to calculate formal education completion rates. We feel confident that by employing this calculation, which uses fully active learners instead of registration numbers, MOOC completion rates will be in line with completion rates in formal university education.

MOOC Success

The success of education delivery depends on a wide range of strategies and tactics that are employed by educators. In the not-so-distant past, educators were primarily limited to the presentation of topics and resources in face-to-face settings to guide students along academic pathways. As technologies such as radio, television, CD-ROMs, the Internet, mobile devices, and smartphones were integrated into the education space, the potential for successful educational delivery was expanded considerably. With social media tools and increasing global broadband access to the Internet, the potential for learner success seems limitless, at least in terms of access to information and resources. Yet while technologies have moved to all kinds of digital forms and points of access, education's success still depends on the strategies and tactics used by educators. The challenge for modern educators is to be able to harness "worth-it" technologies to support their learner needs, being mindful of not overwhelming learners and at the same time meeting the needs of an ever-widening learner demographic.

This is nowhere a more prominent challenge than in online learning. Online learning has been well researched, and best practices have been established since the early 2000s (Garrison et al., 2001). Despite this, online learning took a big leap forward with the proliferation of the MOOC phenomenon, especially in terms of the potential for many tools and technologies to be developed to support MOOC learners. The global Covid-19 pandemic of 2020 has further increased the worldwide reliance on technology-enabled learning. Without a doubt, online learning and delivery of education via Internet tools has come to the forefront of attention since the pandemic, and the need for quality online learning continues to grow. MOOC research has provided a plethora of interest and findings about online learning delivery (De Freitas et al., 2015). One aspect of MOOC research, the goal of increasing learner success (and, by extension, completion rates) has generated

considerable interest. With this in mind, quality online learning design and delivery are key to supporting learning success. This chapter provides a pathway through some of the most important aspects for quality online learning. While the chapter focuses on MOOCs, these discussions are also relevant to online and blended learning designs, as learner success is what all educators strive for.

In order to focus our discussion about MOOC success, we considered the following question: *What instructional approaches and strategies have we found that result in increased levels of TELMOOC learner certification?* Across ten deliveries of the TELMOOC, we have identified a set of lessons learned that can guide other educators in their design and delivery of MOOCs. Our approach is participant- or learner-centred as opposed to the content-centric extended MOOC (xMOOC) or the connectivist MOOC (cMOOC), the latter of which is constructed as an emergent model of learning. These lessons have been incorporated into a holistic approach to MOOC design. This framework articulates lessons from the TELMOOC as well as seven other MOOCs we have implemented and that have been delivered over 50 times since 2012. As distance education practitioners in the MOOC space incorporating evidence-based strategies and tactics, we have seen increased learner engagement, high attendance at synchronous sessions, higher than average completion rates, and overall participation patterns of MOOC interactions that remain steady during four- to six-week MOOCs.

Many of the discussions and research we present in this chapter originate from best practices in the face-to-face, blended, and online education fields. As our communities become more global in composition, educators often face similar challenges in order to meet the needs of all of the learners in their care. The argument we make is that successful MOOCs align elements of four pillars of education

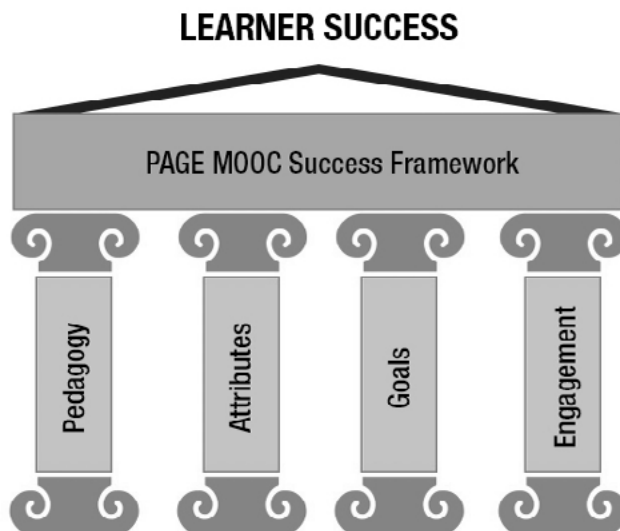


Figure 6.1. PAGE MOOC success framework.

practice. The result can be evidenced in high levels of learner participation and increased levels of MOOC completion. We believe that pedagogy, learner attributes, goals, and engagement are the four pillars that MOOC design and delivery teams should consider when making decisions about quality. We call this the PAGE framework:

1. **Pedagogy:** MOOC type and alignment with knowledge acquisition/integration
2. **Attributes of learners:** learners' time, effort, and intentions (what is drawing learners)
3. **Goals:** course objectives (training, professional development)
4. **Engagement:** authentic learning, course design, and delivery strategies that include scaled engagement with an instructor

Pillar 1: Pedagogy

Described in the literature are a plethora of different MOOC types, many of which fall somewhere on what we describe as a cMOOC (connectivist MOOC) to xMOOC (eXtended) continuum. These two MOOC types accomplish considerably different educational objectives. As they also present a specific structure, there is a need for different considerations when designing MOOCs for successful learner completion. Let us start by looking at the cMOOC. In a cMOOC, personalisation and choice of learner engagement — where learners make self-directed decisions about what, where, and how they learn — are the goal. Activities in a cMOOC are fluid, and learners are in full control, enabled by Web 2.0 social software. There are

four types of activities: aggregate, remix, repurpose and feed forward. Therefore the intention of cMOOCs is to harness the power of social and participatory media to enable participants to communicate and collaborate through a variety of channels; for example Twitter, blogs, wikis, etc. and the use of hashtags and curation tools (such as Pinterest or Scoop.it) to filter and aggregate. The focus is on personalisation, but also collective intelligence (Lévy 1997). Each participant forges their own learning path through the materials; picking and mixing which content, activities and communications are meaningful for them. (Conole, 2014, p. 70)

One way to look at cMOOCs is that they focus on knowledge construction and sharing using networked learning affordances. Here, the learner is in full control of what, when, and how to engage with content or engage with other learners, Learning emerges for the learner as they follow along with a crowd, participating as they wish. It could be argued that cMOOCs provide parallel pathways of completely self-directed learning. This emergent form of MOOC learning is unsuited for formal education settings, and at this time, there appears to be little evidence that connectivist designs add enough to learning opportunities to replace the structure and common progression through courses that learners need.

The xMOOC, created in 2011, originates from a goal of providing open access to Ivy League formal university education. As a result, the structure of xMOOC

deliveries, including the software systems used to deliver them, have been developed to provide institutional control of the learning. This is described by one of Coursera's co-founders speaking about the xMOOCs they develop: "It's an LMS [learning management system] that's wrapped around a very high-quality course.... It's not just the box, it's a course in a box" (Hill, 2012, p. 2, quoting Daphne Koller). This is an institution-centric approach to learning and basically puts the didactic sage-on-the-stage approach online.

Coursera type xMOOCs designed in accordance with the old-fashioned traditional behaviorist model are systems in which information is directly transmitted rather than environments in which critical, creative, and unique thinking skills are developed. The behaviorist model is primarily based on the transfer of information from the teacher to the student. This situation reduces the students to a position in which they merely receive information, preventing their creativity and cognitive development. In xMOOCs, information is transferred from instructors to students through video courses and the learners are later evaluated through various tools. (Kesim & Altınpulluk, 2015, p. 18)

In other words, xMOOCs focus on knowledge duplication, with decisions about what and how learners access and interact with resources prescribed to the learner by the institution's instructional team.

Where does TELMOOC fit in to the MOOC type discussion? As we discussed in Chapter 1 when describing our iMOOC model, the TELMOOC is somewhere in the middle of the cMOOC and xMOOC design continuum. Intentionally, the design is a combination of xMOOC elements (multiple-choice questions, for example) and cMOOC elements (personalisation, networked learning) encompassed in a community of inquiry framework. Table 6.1 provides an overview of some of these. Our online instructional design and research over 20+ years have provided us with many metrics, examples, and designs of quality online instruction. MOOC design is, in our opinion, best served with the CoI as an overall framework.

Other researchers have proposed similar types of hybrid c/x models of MOOC design. In a study conducted by Anders (2015), MOOCs that would be classified as c/x hybrids were analysed to demonstrate the value of the hybrid model while also clarifying appropriate applications and design challenges for MOOCs. Results of Anders' study indicated that hybrid designs may support the greatest diversity of learners and scaffold engagement with networked and emergent learning contexts (Anders, 2015). The iMOOC model goes beyond this c/x hybrid and incorporates inquiry as a community activity to further support learner development. One way we view the community element as being so crucial to MOOCs is that it gives voice to participant expertise. Many MOOC participants themselves are very well educated and have much to share about integrating MOOC topics into the contexts of their experiences. The iMOOC model provides an avenue for all participant expertise to be encouraged, shared, and highlighted as relevant course content, as it truly is the course content interpreted from a participant perspective.

Table 6.1. Comparing xMOOC, iMOOC, and cMOOC elements

xMOOC	iMOOC	cMOOC
Instructivist	Constructivist	Connectivist
Behaviourist	Constructionist (Papert, 1991)	
Institution controls all aspects of learning	Instructor and student control elements of the learning Peer-to-peer interaction paramount for supporting learners	Student in control of all aspects of learning
Scaling of old pedagogical practices: lectures, exams	Blending new social networking approaches while incorporating limited lectures	New online pedagogies based on social networking
New LMS, media, and digital tool supports	Social media practices in new LMS that features media and digital support tools CoI Networked learning	Social media and Web 2.0 tools Networked learning
Instructor as content presenter, little to no instructor–learner interaction	3 levels of instructor: as content presenter, as guide and inspirer, as networking facilitator	Instructor as guide
Low instructor presence	High instructor presence	High instructor presence

One example of how the global participation in the TELMOOC — which is like many open MOOC platforms — can support learning across all participants is as follows: A Bangladesh Free School teacher shared within the TELMOOC discussion forums a short video of his technology-integrated solution when there was only one computer for a classroom of children. Several participants from countries around the world, including those in countries understood to be developed countries, were directly supported and encouraged by this teacher’s simple solution to an education technology-sharing challenge (with one computer and one CD-ROM for 25 early childhood students, students sat around the computer on the floor, and speakers were attached to the laptop so all could hear and follow along with the English lesson). This example demonstrated to the TELMOOC team how powerful participant expertise in context was for the community. In an iMOOC, participant discussions, even participant-created forums, are important elements of the course content, and for professional development or lifelong learning activities, the value of participant expertise cannot be understated. The shared knowledge integration of a CoI-framed MOOC supports learners as they contextualise the course topics into their own situations.

To summarise, there is a continuum of pedagogical approaches that can be utilised in MOOCs, and the quality of a MOOC is dependent on this approach of matching the level of participant autonomy that leads to success for learners. This alignment of pedagogy to participant autonomy is the first pillar of the PAGE MOOC success measure.

Pillar 2: Attributes of Learners

The second pillar of successful MOOCs is the attributes of learners. There has been considerable interest in learner attributes, particularly in determining whether any can predict completion in MOOCs. Some research indicates that several learners never intend to complete MOOCs, and that they take MOOCs for other reasons, such as personal interest or curiosity. While prediction of completion has value from some MOOC providers, we feel that understanding learner attributes to best serve them in a MOOC setting is proactive and a better use of resources. In this section, we take a closer look at some of the key learner attributes that should be recognised and addressed to remove barriers and provide meaningful supports for learner success. Many learner attributes have been studied and presented by MOOC researchers since the explosion of MOOCs in 2012. However, we identify two attribute areas that seem key to focus on for learners' success:

1. Motivation and grit: high self-regulation skills, mature age, prior degrees
2. Intention: reason for taking the course lines up with course goals (what draw learners)

Motivation and grit

While we acknowledge there is considerable research into learner dropout and retention in higher education, distance education, and MOOCs, our discussion here focuses on learner attributes that appear to be distinctive in our MOOC experiences. One way we can understand learner attribute importance in relation to MOOC success is to consider which attributes researchers indicate are related to course completion. Several models have emerged from research on learner dropout and retention rates in higher education settings. Tinto (1975) and Kember (1989) developed models describing learner attributes and situational factors across time that were observed to make a difference when considering dropout rates in higher education. Tinto (2010) revisited his model in the distance education context and identified persistence as a learner attribute that can be viewed as the motivation of a learner to persist in education. Kember (1995) looked specifically at dropouts in open distance education courses and concluded there are many complex factors involved in dropouts:

factors like family, personal motivation, and capabilities available to complete the program, along with previous achievements and experiences in education and institutional support. Kember assumed that the participants in distance education were employed adults with families. Among the situational factors that affect their schooling, it is particularly important for a participant to take care of their family, work, and study commitments (Kember, 1989), which is a much smaller, if existent, factor for fulltime students. Kember also believes that family circumstances, such as age or number of children at school age, housing conditions, or obligations arising out of the profession significantly influence decisions concerning the suspension of each study participant or participants. (Radovan, 2019, p. 29)

While these two models examine elements close to MOOC contexts, the vast range of learners in a MOOC makes it likely they are all at play in a MOOC at some time for some segment of the learner population. Clearly, there is a complex dynamic at play regarding dropouts and retention, but we argue MOOCs have two distinct learner attributes at play that should be considered.

A dissertation study (Newton, 2016) found that neither lack of prior online experience nor academic readiness were factors in predicting success and that MOOCs do not offer an advantage or disadvantage to any racial group in terms of completion. In a Decision-Making Trial and Evaluation Laboratory (DEMATEL) study that explored MOOC dropout factors, Aldowah et al. (2020) identified six core factors that influenced MOOC dropout: academic skills and abilities, prior experience, course design, feedback, social presence, and social support. They further described other factors — such as interaction, course difficulty and time, commitment, motivation, and family / work circumstances — that were found to play a secondary role in MOOC dropouts. These and many other studies have identified a wide range of possible factors for MOOC dropout, but we think considering the attribute areas that support completion is more useful. This is especially true when we look at attributes through the lens of an educator who seeks to understand the learners under their care.

The first of two key attribute areas we identify (from both the literature and our experience) that aligns with learner success, understood as MOOC completion, is what we describe as motivation and grit. Tinto's (2010) description of persistence confirms this attribute as of key importance. Learners who have high self-regulation skills, are of a more mature age, and have prior degrees demonstrate higher levels of MOOC success. These demographic factors point to prior motivation and grit or persistence related to education. For example, Salmon et al. (2017) in their review of MOOC participants stated that MOOC learners are driven by a combination of cognitive, self-assertive, and task goals, all of which enhance their motivation to finish the MOOC. Further, motivation has been explored in a logistic regression analysis (Semenova, 2020) that showed learner motivation has a significant relationship to MOOC completions:

However, not all motives for participation in MOOCs are significantly related to the chances of earning a certificate of completion. Intrinsic motivation, a motive for getting skills that could be useful for changing the workplace, and a motive for earning a certificate significantly increase the chances of a MOOC's completion. (p. 1)

Other research confirms that MOOCs may be best suited for individuals who are self-directed, lifelong learners and take responsibility for their professional development, and that individuals become more self-directed when they mature (Schulze, 2014). Grit has been defined as “perseverance and passion for long-term goals” (Duckworth et al., 2007). A study by Wang and Baker (2018) identified grit as one motivational variable for MOOC completion:

We compare that relationship to the degree to which MOOC completion is predicted by other domain-general motivational factors such as grit, goal orientation, academic efficacy, and the need for cognition.

We find that grit and goal orientation are associated with course completion, with grit predicting course completion independently from intention to complete, and with comparable strength. (p. 1)

As we would expect, motivation plays a significant role in MOOC success, as it provides the impetus for learners to choose to participate. It appears that grit further describes why motivated learners are more likely to continue towards MOOC completion.

While motivation and grit are important learner attributes for success, recognising that mature learners are more capable (Hone & El Said, 2016) has a purpose. The Zhang et al. (2019) study of Coursera MOOC participants found that “older participants (age > 50 years old) have higher probability of completing the MOOC,” which provides a benchmark for MOOC instructional teams to consider. By using pre-course surveys, as we did in the TELMOOC deliveries, MOOC delivery teams can plan accordingly for interventions during the delivery of the MOOC. For example, identifying that there is a significant portion of MOOC participants who are younger prepares an instructional team to be able to respond during the delivery in a different way, perhaps by having live support sessions during the early stages of delivery. Another intervention that an instructional team might consider if a large portion of the MOOC-takers are young is to implement game or badging aspects in the MOOC, again adding additional support for learner success. This is not to say that increasing live sessions or badging aspects in a MOOC are not valuable for all learners, but rather to acknowledge there are resource and time limits for MOOC design and delivery, and where certain age populations are expected or found to be participating, there is more need to address alternative supports than when participant populations are more mature and educated.

Intention

The second attribute of learners that we consider as a factor of MOOC success is learner intention. MOOCs provide opportunities for lifelong learning, but regardless of how promising these opportunities are, many learners who intend to complete MOOCs do not succeed. Two important elements reported in the research literature that lead to completion (Zhang et al., 2019) are academic alignment with student needs, and learner intentions to complete the MOOC. Other research confirms that most students are led to MOOC enrolment through close alignment of the course topic and subject matter with their personal or professional goals and through the establishment of an attractive value proposition. “Progress in the MOOC depends on whether this goal alignment is maintained, and whether the value assumptions of students are met or exceeded” (Howarth et al., 2016). So how successful were we in the TELMOOC marketing and promotion in terms of addressing the alignment of the topic with learners’ needs? The following paragraph lists how the TELMOOC was described in marketing and promotion activities:

Introduction to Technology-Enabled Learning is designed for teachers in diverse contexts – secondary education, post-secondary education and vocational education. You will benefit from this course if you are

teaching face-to-face or in a distance/ online environment. Anyone interested in improving teaching and learning would enjoy participating in this MOOC. (Commonwealth of Learning, 2017, p. 2)

We present the findings from our TELMOOC pre-course survey in Table 6.2, showing 50% of learners were taking the course out of interest. Additionally, 36.6% of TELMOOC learners were taking the course as professional development. There were 198 other comments that included a variety of reasons, from gaining skills to enable online teaching, to being mandated by their institution.

Table 6.2. What is your primary reason for taking this course?

Survey replies	# of survey responses	% of survey responses
General interest in MOOCs	225	4.6%
General interest in technology-enabled learning	2,432	50.0%
Obtaining a certificate	227	4.7%
Professional development (contributing to your CV, for example)	1,780	36.6%
Other	198	4.1%
Total	3,798	100.00%

Some of these other reasons learners indicated for taking the TELMOOC were:

- Be able teach my student[s] online
- It is mandated by our college.
- Effective management and supervision of content developers
- Learning the tool for developing online learning materials for courses
- Covid-19 was thrown into online teaching for the last 3 weeks of last semester, and my spring course is now entirely online.
- I believe that one learns best by doing. Technology has changed radically in the last 4 decades and my skills and ability to utilize those newer skills need upgrading. This program seems to be an opportunity to continue to learn by doing.
- Enhance my teaching skills and facilitate learners' educational apprenticeship
- I hope to be able to supplement my income by offering online classes.

We feel confident that the TELMOOC marketing reached the appropriate students, and we now turn our attention to their intentions for MOOC completion. In Table 6.3, we present the TELMOOC learners' intentions. From the TELMOOC pre-course survey (n = 3,807, 20.9% of total course registrants), we find that 92% of TELMOOC registrants indicated they intended to complete all the course activities. As only 20.32% of registrants did complete enough course activities to receive a certificate, pre-course survey intentions do not seem to be a strong predictor of completion rates. As we discussed in Chapter 5, a stronger predictor of course completion rates appears to be the number of learners who are committed to the course after an initial period of the course delivery.

Table 6.3. Which of the following best describes your intention to complete this MOOC?

Survey question options	# of responses	% of responses
Have not decided whether I will complete any course activities	151	3.97%
To browse the course contents, but not planning to complete the course	35	0.92%
Planning to complete all activities to earn a certificate of completion	3,492	91.73%
Planning to complete some course activities, but not planning to earn a certificate of completion	129	3.39%
Totals	3,807	100%

TELMOOC learner interest with the MOOC topic clearly is strong, as is learner intention to complete all the course activities. Why, then, is there a significant disconnect between learner intention and actual MOOC completion rates? What can we learn from this disparity, and how can it be addressed? The answer may be that barriers arise during learner participation in a MOOC.

Barriers to MOOC success appear to be significant for learners (Radovan, 2019), and by understanding them, we can perhaps devise ways in which MOOC design and delivery teams can mitigate some of them. In a study conducted by Hone and El Said (2016), findings show that it is challenging to combine work and family life with lifelong (online) learning activities, especially for learners in early adulthood and mid-life. Sener and Hawkins (2017) identified that time and other commitments can be significant barriers for online learning. Their study examined online courses delivered to faculty as professional development, so their findings are directly relevant to the TELMOOC. Sener and Hawkins (2007) reported that time conflicts with work commitments, level of organisational support, and learners' early course experience were important factors affecting completion rates in online facilitated courses:

Most faculty took online facilitated courses as an added responsibility instead of having designated learning time comparable to what typically occurs for classroom courses. The resulting infringement on non-work hours and increase in learners' job hours produced results which corroborate other studies' findings that time conflicts with work commitments result in increased course attrition rates. (p. 42)

A third study, by Aydin and Yazici (2020), confirmed the theme of time as a significant barrier for MOOC learners. Aydin and Yazici's study of learner dropouts in the Turkish MOOC platform AKADEMA identified three categories of reasons for non-completion: personal reasons, platform (program)-based reasons, and design-based reasons.

Among personal reasons, the "other responsibilities" was the most often cited reasons of non-completion. Meanwhile, length of the

courses (too long) among platform (program)-based reasons, and insufficient timely feedback from the instructors among the content designbased reasons were noted the most. (Aydin & Yazici, 2020, p. 9)

Numerous other studies in the research literature have indicated that time — either time available to complete or time that is provided through volition — is the most significant barrier for MOOC completion (Henderikx et al., 2017; Khalil & Ebner, 2014; Kizilcec & Halawa, 2015).

As several members of the TELMOOC instructional team had been developers of online professional development courses in the past, they were aware of time as a dominant barrier. Firstly, MOOCs that last for 12 or 13 weeks, which are common delivery lengths for university and college courses, are simply too long for lifelong learning or PD-type education opportunities. The TELMOOC team decided that the overall length of five weeks was sufficiently long to present resources and information to learners, allow them to engage in the learning community established in the MOOC, and yet have opportunities to gain valuable professional learning. Similarly, they acknowledged that learner time for weekly activities, added to learners' busy lives, was limited. University and college courses typically design 10–15 hours of learner engagement in one week of a course. The TELMOOC was designed for two to three hours of engagement but allowed significant opportunity for additional learner exploration of weekly topics through the provision of additional resources and information. Not only did these weekly extra exploratory resources give learners who could spend more time topic-relevant information, but they also provided scaffolding for learners who perhaps were new to the topics presented in any given week of the course.

Time as a consideration is related not only to the amount of time a course requires, but also to deadlines for assessment submissions: “Around half of the respondents indicated two time-related reasons as influencing their decision to stop participating. In a typical course (median proportion), 66% faced issues keeping up with deadlines and for 46% the course demanded too much time” (Kizilcec & Halawa, 2015, p. 61). The TELMOOC instructional team was keenly aware of the time learners had available to spend on activities at any specific point in the delivery, and extreme flexibility with deadlines and submission dates was the norm. Despite the TELMOOC being a five-week course, all of the activities (quizzes, discussion forums, etc.) were available until the end of the sixth week. The TELMOOC team further supported learner submissions of the final assessment even beyond the six-week window as much as possible, recognising that time was a significant barrier.

In summary, time flexibility was either built into the TELMOOC or provided during delivery in the following ways:

- short course length (five weeks)
- limiting the time for required weekly activities (two to three hours)
- flexible course dates for submission of all grades (until the end of the sixth week)

- live presentation sessions, including presentation slides, were recorded and posted for learners who were not able to attend (in three formats: video, audio, and PDF transcripts)

How did the TELMOOC time considerations rate according to the learners? To answer this question, we present findings from the Likert-type survey question “Did the TELMOOC meet your time commitment expectations?” In Table 6.4, 87.3% of participants in the post-course survey indicated they had met their learning objectives, which demonstrates significant support that the time constraints the TELMOOC instructional team applied were appropriate. While these time accommodations in the TELMOOC were provided to learners, Khalil and Ebner (2014) offer other examples of how the time barrier can be lessened. They suggest accommodating learners on different timetables for the course delivery, as some learners wish to

move through the course week by week, others want to have freedom to explore the content during the entire run of the course, and others want to get all the lecture videos and assignments right up from the very first beginning, (p. 1240)

Table 6.4. The TELMOOC met time expectations

Agree & strongly agree	1,618	87.3%
Neutral	126	6.8%
Disagree & strongly disagree	110	5.9%
Totals	1,854	100.0%

To summarise pillar 2, which we identify as attributes of learners, we wish to highlight for MOOC designers the importance of being attentive to the following:

1. Learner demographics can be accessed using pre-course surveys, and the age/maturity of learners should be attended to in both course design and instruction delivery, so additional support can be provided for younger and/or less-educated learners.
2. Motivations and intention to complete a MOOC are closely aligned with MOOC topics. Hence, the course outcomes should be clearly articulated prior to and early in the course so that learners who choose to register have clear understandings of the course objectives.
3. Flexibility in the time available for learners to participate in the course is paramount in all respects: length of course, deadlines for assessment submissions, weekly time expectations, etc.

This alignment of motivation/ grit and intentions to participant capacity is the second pillar of the PAGE MOOC success measure.

Pillar 3: Goals of the MOOC

The third pillar of successful MOOC design and instructional practice is simply the goals of the MOOC. While this seems obvious, successful learners (as described in the attributes pillar) continue to attend and complete MOOCs when they are provided with a meaningful value proposition. The importance of goal alignment with learners registering in a MOOC cannot be overstated. We identify three goal categories for MOOCs: personal interest, formal learning and support, and professional development (PD). If learners are coming to a MOOC out of general interest in the topic and little else, such as with an astronomy or dinosaur MOOC, they need to see significant indication that the course will be valuable and worth completing. On the other hand, if learners are coming out of the need for additional professional practice knowledge (professional development), such as with computing or climate science MOOCs, the value to learners is different, and completion may not be what learners are striving for. Thirdly learners could be enrolling in a MOOC to support their learning in formal education settings (university or college courses); again, the value proposition for completion is different than in the previous “interest” and “professional learning” examples. Understanding that success (completion) is directly related to the perceived value of learner participation in the MOOC, and because learners have limits on their time, we feel the goals of a MOOC need to be aligned with what the majority of learners are coming for.

For instructional designers, the process of developing courses is significantly different in MOOCs. Formal learning design processes involve needs analysis and the development of learning objectives and outcomes in order for course outcomes to fit into programme outcomes. In the case of MOOCs, instructional designers do not have the benefit of a needs or programme fit analysis, which delineates the learners who will be coming into the course, and this directly affects learner success. MOOCs, because of their open access element, can provide access to anyone who has a device that can access the Internet.

While the mainstream admission approach at universities is to filter applicants and throw out everyone deemed unable to succeed in their learning program, MOOCs admit everyone who wants to take the course with a mouse click instead of filtering and rejecting those who will be likely to fail. In other words, because MOOCs give everyone a chance to explore and try for themselves at different levels and depths of engagement, the assessment of their engagement and success must take the variability of participant engagement and learning into account. (Vu & Fadde, 2014, p. 246)

The wide range of learners, in terms of geographical location as well as cultural norms, is perhaps one of the more significant challenges that MOOCs pose for developers. In a study that Kizilcec and Halawa (2015) conducted, they revealed a global achievement gap and a gender achievement gap. “Performance and persistence in the course was substantially lower for women and learners in Africa, Asia, and Latin America than men and learners in Europe, Oceania, and Northern

America” (p. 61). This phenomenon identified was also reported by Thomas (2002) in placebased higher education, who stated that “greater diversity will necessarily lead to an increase in student withdrawal” (p. 423). Within the TELMOOC, the diversity and range of country of origin and gender within each delivery of the TELMOOC was different. The goals of the TELMOOC could not be changed between deliveries or even during the course itself, and it is important to ask how the goals of the TELMOOC were developed.

So how, then, can goals be aligned with learner expectations when MOOCs have such a diverse learner demographic? Diverse learner expectations are one of the reasons we feel strongly about the validity of our active MOOC learner metric that we presented in Chapter 5. In formal learning courses, learners come to the course as part of a programme of study that results in a formal learning credential. MOOCs present no such formal learning credential, so that alignment of learner need does not exist.

There are several ways that MOOC goals can be aligned with the diverse learner population choosing to participate. The first way we are aware of is to carefully consider who the MOOC is intended for, then as best as possible, line up the course objectives with the reason bringing the target population into the MOOC, and finally be sure to describe these objectives during promotion of the MOOC.

In the case of the TELMOOC, the COL initiated the course topic and objectives. COL had conducted a needs analysis within their network of Member States, and technology-enabled learning was identified as a priority. While this aided the overall goal and objectives development, articulating the course objectives was key to reaching the attention of learners who were aligned with the course topics. Promotion of the TELMOOC, which was identified as a professional development MOOC, always highlighted and described the course objectives in the following manner.

In the TELMOOC, participants from diverse contexts — secondary education, post-secondary education and vocational education engage in the following:

1. Meet online with teachers all over the world who are also learning about technology-enabled learning
2. Be supported by instructors who understand technology-enabled teaching and learning
3. Explore easy-to-use technologies for classroom and online teaching
4. Evaluate best fit technologies for teaching/learning contexts
5. Experience a fun and collaborative learning environment via the Internet

A detailed look at the TELMOOC post-course completion survey reveals that in fact, the TELMOOC did meet the needs and expectations of learners to a significant extent. We present findings from the Likert-type survey question “Did the TELMOOC meet your learning objectives?” In Table 6.5, 94.1% of participants of the post-course survey said it met their learning objectives. Of the participants who did complete this survey question (n = 1,857), we expect that many of them were also successful learners who received a certificate.

Table 6.5. The TELMOOC met learning objectives

Agree & strongly agree	1,748	94.1%
Neutral	40	2.2%
Disagree & strongly disagree	69	3.7%
Totals	1,857	100.0%

A second way to align MOOC goals was identified in research conducted by Zhang et al. (2019), who reported learner success increases when the MOOC provides experiences that add to students' current academic backgrounds and when MOOCs are hosted by institutions with a strong academic reputation. If an institution has a reputation for a world-renowned programme in quantum computing, learners will recognise this and respond. This second example of MOOC goal alignment, particularly for MOOCs developed for personal interest, is highlighted in an example we are familiar with. Curtin University, based in Perth, Australia, is home to the world's largest radio telescope array,² which was developed and operated by some of the faculty in the Curtin astronomy programme. "This MOOC highlights some of Curtin's world-class expertise in the radio astronomy field, connected to the work we are doing with the square kilometre array and Murchison array projects" (Curtin University, 2013). The international acclaim this project garnered was identified by Curtin University as unique expertise that had global interest appeal. As such, it was selected for an appropriate Curtin MOOC because of the institutional and instructor reputation. The six-week Curtin astronomy MOOC, delivered on Open2Study, was successful, with a 30% completion rate in its first offering (Curtin University, 2014), because the expertise that was promoted brought in many learners who were aligned with the goals.

Another such example would be if an institution had a Nobel Prize researcher in some specialty research area, so the reputation of the researcher garnered interest in a MOOC topic. In the case of the TELMOOC, the AU and COL partnership agreement was significant. Athabasca University brought 50 years of experience in open and distributed distance education, and the COL brought its reputation as the leading Commonwealth intergovernmental agency promoting the use of distance education and technology-enabled learning. COL, as part of its role as an enabler, capacity builder, and catalyst, identified AU as the partner to deliver the MOOC. Both reputations supported the partnership and extended the reach of goals for the MOOC they co-developed. Partnerships are perhaps another way to align goals with MOOC learners, as leveraging a partner's networks demonstrate to potential learners the high institutional standards and expertise attached to a MOOC.

2 See <https://astronomy.curtin.edu.au/research/squarekilometrearray/>.

Pillar 4: Engagement

Up to this point, we have considered the first three pillars of MOOC quality: pedagogy, learner attributes, and goals. The fourth pillar, engagement, is where design and delivery provide an opportunity for instructional teams to actively address and support MOOC quality. Engagement is where the interactions that students participate in matter most to their success. As Meyer (2014) indicated, student engagement can affect student satisfaction. Instructors' efforts to engage students can help students to form a sense of community and bring about higher retention rates. The social identity and learner autonomy that learners bring to online courses are intertwined with their sense of belonging to an online learning community. We believe there are interventions that instructors and instructional teams can enact in order to support learners and engage them at several levels during an online course. Considering transactional distance theory helps make that point clear as well:

Transactional distance theory is composed of three elements: dialogue, structure and learner autonomy; these elements are closely related to the actors of complex interactions during student engagement, such as learner, instructor, content and interface. Paying attention to these elements may help instructors and researchers reduce the perceived distance of learners to foster student engagement. (Pursel et al., 2016, p. 205)

Moore (1993) defined transactional distance theory as a pedagogical concept that describes the nature of all instructor–learner relationships when instructors and learners are separated by time or space. His transactional distance theory can be elaborated on as comprising (i) dialogue or the interaction between instructor and learners, (ii) the structure of the instructional program, and (iii) learner autonomy or the nature and degree of the learner's self-directedness.

In many ways, the interactions (and design of them) introduced in Chapter 4 describe the reasons we believe specific instructor–learner interactions are so crucial for a quality MOOC. As a success pillar, MOOC engagement is directly related to learner success, and there are two places where educators can ensure high quality: in the design of instruction, and in the delivery of instruction. In Chapter 4, we outlined how engagement via learner interactions was supported specifically in the TELMOOC design. In this segment, we will provide more examples of what instructors can and should do to support the learner engagement we would expect to see in successful MOOCs.

One of the misconceptions about the Ivy League universities and the xMOOCs they developed was the belief that because of their reputation for high-quality education, their online courses would also be of high quality. While replicating place-based institutional courses of high quality in an online format sounds possible, online course quality relies on more than simply high-quality lectures and information based on cutting-edge research. One of the most significant critiques of MOOCs overall is their lack of learner engagement, due in part to the cost of providing quality engagement to large numbers of learners. Khalil and Ebner (2014) indicated that MOOC attrition was reported by learners to be connected to

“feelings of isolation and the lack of interactivity in MOOCs” (p. 1236). In practice, planning (the design) and delivery (the teaching) can both support learner engagement, and we demonstrate ways in which, despite having many learners, MOOCs can engage learners effectively without massive costs.

Our first consideration can be looked at as answering the question: *What design elements used in MOOCs result in effective learner engagement?* We present research and the TELMOOC case as an example for the following areas: course length and best practices in MOOC design.

Course length

One of these design elements is simply course length. While xMOOCs often are replicating a place-based institution’s formal course length of 12 or 13 weeks, it is much more difficult to maintain engagement over several months of a MOOC. Shorter modular courses result in more learner success. We argue that if too long of a time commitment is expected, engagement will wane as a course continues.

In her review of public domain information on MOOCs, Jordan (2014) found that longer courses (n = 87) attract a greater number of registrants, but completion rates (as a percentage of the total enrolment) are negatively correlated with course length (n = 39 MOOCs). Jordan (2015a) makes a case in favour of shorter, modular courses with guidance as to how they could be combined, recommending further research to examine the effects in practice. (Padilla Rodriguez et al., 2020, p. 47)

This is further evidenced in research conducted by Henderikx et al. (2017), which confirmed that completion rates vary significantly according to course length, with longer courses having lower completion rates. It appears that for MOOCs, between three and five weeks is an optimal course length.

In the case of the TELMOOC, the decision about the length of the course was based on several factors. These did include an understanding that longer MOOCs required too much commitment, particularly as MOOCs are at no cost to learners. Second was the consideration of how much time is required to develop an online community of learners, as personal connections take time to develop. One significant decision is that every time the five-week TELMOOC was offered, it was extended to the end of six full weeks for learners to participate in forums, quizzes, and assessments. It was possible for a participant to join the course in the fifth week and still complete all of the activities. This speaks to the flexibility that the TELMOOC strived to offer, as learners were recognised as mostly being employed education professionals fitting the MOOC into their personal time. In Figure 6.2, we provide some evidence that the quality and success of the TELMOOCs are represented in the levels of engagement maintained during the delivery. We present forum posts as a measure of learner engagement, as much of the learner activity can be found in the discussion forums. While engagement show a relatively steady participation rate across the five weeks, even week 6, which was not further facilitated by the instructional team, had significant learner engagement.

While we present Figure 6.2 in our discussion of course length, it is a TELMOOC analytic that demonstrates MOOC engagement can in fact be maintained, despite the reported “steep-drop off of activity” that Clow (2013, p. 185) identified. Clow’s (2013) funnel of participation concept described how in MOOCs, learner participation is high during the first week or two, and then a drastic drop-off of participation occurs, with a resulting low completion rate. Clow’s reasoning for the drop-off was that the funnel of participation is characteristic of online social networks and open networks. The TELMOOC engagement data presented in Figure 6.1 clearly show that when quality engagement is maintained, supported by the development of a community of inquiry, MOOC learner engagement levels can be kept quite high.

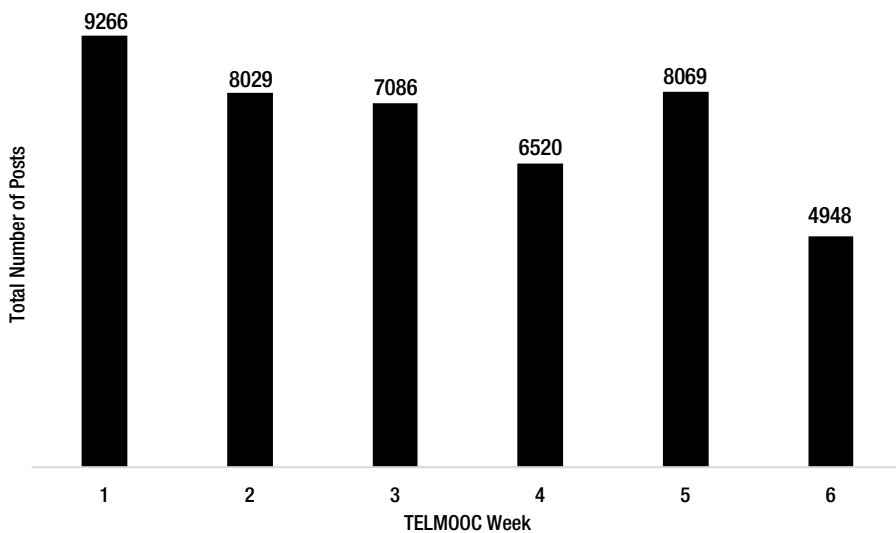


Figure 6.2. Engagement average across six weeks for TELMOOCs 1–10.

MOOC design best practices

Best practices are defined in the *Oxford English Dictionary* as “[c]ommercial or professional procedures that are accepted or prescribed as being correct or most effective.”³ In the case of MOOC design, the challenge for MOOC designers to connect with effective e-learning practices as opposed to technology practices is evident. Montgomery (2016) reported the following about MOOC design teams:

Experts use the same tools for traditional, online, and distance learning in the process, which was expected; however, many did not use the theories for distance learning such as community of inquiry concerning communication between instructor and learner as described by Garrison (Akyol & Garrison, 2011; 2013; Garrison et al., 2001) or transactional distance by Moore (M. G. Moore et al., 1992; M. G. Moore, 1987, 2013). The research plays a vital role in the development

3 See https://www.lexico.com/definition/best_practice.

of effective distance education and massive open online courses. (p. 151)

This disconnect between MOOC design teams and their awareness of best practices in online and distance education is why we have introduced this as part of pillar 4.

Our two examples come from dissertation studies. First is Montgomery's (2016) list of best practices, which point out that designing a strong foundation to support and engage learners does lead to increased participation and completion rates:

- Incorporating a variety of multimedia materials and including pauses for evaluation, assignments, and other activities provided students with an engaging learning environment.
- MOOC materials and multimedia should be shorter, well thought out, and of high quality.
- In online communities, discussions groups should be smaller or scaffolded.
- Communications, both feedback and discussion, should be frequent, continuous, and engaging, not automatic.
- A mixture of guided and learner-led discussions is better for promoting participation.
- MOOC lengths and badges had significant impact on participation as well. (p. 156)

Along the same lines is Ostashewski's (2013) research describing networked teacher professional development (NTPD). Developed around the same time as the original MOOCs, NTPD is based on networked learning theory, teacher PD theory, and online learning theory. It was originally described as online-delivered PD activities that teachers could take at no cost, called courselets (Ostashewski, 2010). A courselet is a content-focused unit of professional development delivered within a social networking site, encompassing a module of study of about four weeks in length. While courselets are not massive courses, the underpinnings of their design are the basis of evidence-based online TPD practices. Adding engagement support levels described in the iMOOC design we presented in Chapter 1 is in part how the TELMOOC design originated.

An NTPD activity design (Ostashewski, 2013) was the basis for the activities and engagement pattern chosen in the TELMOOC. NTPD is defined as TPD delivered in an online social networking environment that supports and encourages teachers to learn together, both formally and informally, while allowing them to retain control over their time, space, presence, activity level, identity, and relationships. (Ostashewski, 2013).

Seven NTPD design principles directly related to MOOCs and used in the TELMOOC design are:

1. Design learning relevant to teacher professional practice.
2. Provide for easy access, scheduling and interaction flexibility, and ongoing support.
3. Provide theoretically and pedagogically sound activities.
4. Provide support for learners with varied experience levels.

5. Provide authentic opportunities for networked learning skill development.
6. Support sharing and discourse between learners.
7. Support learning connections to the broader networked community.

In both of these best practice designs, the first for MOOCs and the second for online-delivered TPD, we find engagement described as sharing, guided and learner-led discussions, and scaffolded activities. Pappano (2012) pointed out the engagement challenge, stating that in MOOC design, “because anyone with an Internet connection can enrol, faculty can’t possibly respond to students individually. So the course design — how material is presented and the interactivity — counts for a lot” (Pappano, 2012, para. 6). In the next section, on MOOC delivery best practices, we will discuss how the challenge of responding to individual students can be addressed.

MOOC delivery best practices

Our second point of discussion in pillar 4 looks at answering the question: *What can instructors (or instructional teams) do in the teaching of a MOOC that results in effective learner engagement?*

Table 6.6. Engagement in TELMOOCs 1, 2, and 5

Survey replies	# of survey responses	% of survey responses
Have not decided whether I will complete any course activities	195	4.0%
Planning to complete all activities to earn a certificate of completion	4,454	91.5%
Planning to complete some course activities, but not planning to earn a certificate of completion	178	3.7%
To browse the course contents, but not planning to complete the course	41	0.8%
Total	4,868	100%

Again considering the TELMOOC case, we find another analysis offering evidence that engagement activities found in the TELMOOC are connected directly to learner success and completion. In Table 6.6, we detail how different deliveries of the TELMOOC have resulted in differing levels of sustained engagement. In the most successful delivery, TELMOOC 5, where completion rates were the highest, the instructional team was the most successful at garnering active learners. By the time the TELMOOC had been delivered for the fifth time, the instructional team members had honed their skills in terms of delivery efficiencies. Activities such as weekly instructional team meetings, where instructors and facilitators shared ideas in delivery tactics, were sources of contextualised delivery support. What and how to foster learner–learner connections and encourage the continuation of discussions occurring in the discussions were key to these weekly team meetings.

Idea sharing, including how to frame these connecting or extending discussion-type posts, was pivotal for the effectiveness of the instructional team. So too was the distribution of tasks for facilitators, such as assigning specific forums to one facilitator who would monitor and track ongoing discussions as the course continued. The idea sharing at the team meetings enabled facilitators to stay in touch with the forum tone and postings by learners and bring questions learners had to weekly meetings for consideration. This distribution of facilitation was important, because in the TELMOOC, like other MOOCs, the vast discussion forum posts could be overwhelming to track. In a study of four MOOCs, Soffer and Cohen (2019) used learning analytics analyses to examine 13 variables as predictors of course completions. They found that course learning materials, interpersonal interaction between the instructors and students (reading the posts in the forums), and performance in the tasks and assignments more than doubled the likelihood of completing a course. Further, they noted that engagement in various course activities was significantly important to learner success in a course. The forum discussions and the instructional team being present in the course on a continuous basis were significantly important to learners, as evidenced by our discussion of the TELMOOC practices.

Another significant instructional team tactic was the development of several live sessions targeting specific topics during the course. In Chapter 7, we will dive into the details of these live sessions as well as the role that authentic activity design plays in the TELMOOC's success. Here, however, we point out that the introduction of the live sessions in the TELMOOC delivery, despite not being planned for in the initial TELMOOC design, was identified as being significant for learner success. While the live one-hour sessions, presented by one of the main instructors, were started with a lecture-type activity, the opportunity for learners to ask questions and engage with the instructors in a synchronous opportunity was identified as very important by learners who attended.

Conclusion

The PAGE MOOC success framework is a holistic approach to MOOC design and delivery. It is intended as something quite different than a checklist or best practices list and can be used by both designers and instructors of MOOCs (or even online and blended courses) to provide an overview of what needs to be considered in order to support learner success for as wide a range of learners as possible. While it can be used as a design tool, the descriptions of the four pillars go into more detail about what should be considered in order to move towards higher levels of quality in online learning at scale.

Professional Development

Professional development, professional learning, and lifelong learning are all terms used to describe learning that occurs after formal education has been completed. When considered in the context of teachers, it has been often referred to as in-service education. Joyce et al. (1976) defined in-service education as “formal and informal provisions for the improvement of educators as people, educated persons, and professionals, as well as in terms of the competence to carry out their assigned roles” (p. 6). Regardless of the term used, the goal of professional development in the context of education is to provide opportunities for educators to grow in their knowledge and practice of teaching.

In this chapter, we discuss how the TELMOOC provides for the professional development of educators, be they in grade schools, universities, or colleges. As educators ourselves, we understand educator PD as increasing teachers’ understanding of the processes of teaching and learning. Darling-Hammond and McLaughlin (2011) in their articulation of effective teacher professional development (TPD) stated that “there need to be opportunities available for teachers to re-think their own practice, to construct new classroom roles and expectations about student outcomes, and to teach in ways they have never taught before — and probably never experienced as students” (p. 81).

The TELMOOC is an example of exactly the kind of TPD opportunity they described. This is even truer if one considers the opportunities that the TELMOOC provided during a global pandemic, when educators, most of whom were unfamiliar with online and distance education practices, were almost overnight required to move their teaching beyond the classroom setting. One of the reasons the TELMOOC meets the description of effective TPD is due to the design team’s collective research and experience. The TELMOOC design team included online instructional and media design experts, a researcher whose expertise is in

online-delivered teacher PD, and another researcher who is a CoI expert. In addition, all the design team members are educators themselves, with several having K-12 teaching experience prior to their university teaching positions. The TELMOOC was fortunate to be able to incorporate current evidence-based practices in online learning and TPD. We feel it provides an excellent template or map for others looking to develop online-delivered professional development for educators or in other professions where evolving research and practice are necessary for competent practice.

As leaders in the field of TPD, Darling-Hammond and McLaughlin (1995, 2011) have, together and Darling-Hammond (2008), published numerous research and policy statements about effective TPD. Incorporated into their TPD works are statements that describe conditions for effective professional development. They indicate that effective TPD involves teachers both as learners and as teachers and allows them to struggle with the uncertainties that accompany each role. Effective TPD has six characteristics, which allow it to:

- engage teachers in concrete tasks of learning and development
- be grounded in inquiry, reflection, and experimentation that are participant driven
- involve sharing of knowledge among educators, with a focus on teachers' communities of practice
- be connected to and derived from teachers' work with their students
- be supported by modelling, coaching, and the collective solving of specific problems of practice
- be connected to other aspects of school change

In the TELMOOC case, TPD activities provided an opportunity for educators to specifically focus on learning and teaching with technology. One way to outline the professional development presented to TELMOOC learners is to examine three elements of educational outcomes using Reh's (2017) Knowledge, Skill, and Ability (KSA) framework. Reh (2017) described this framework as one that is often applied to employment. It does provide an understanding of the educator workforce training that the TELMOOC offers. Other researchers, such as Gall and Renchler (1985, p. 6), have also described professional development along the same lines, stating TPD are the "efforts to improve teachers' capacity to function as effective professionals by having them learn new knowledge, attitudes and skills." Combining the descriptions of effective TPD and KSA frameworks provides us with a lens through which we can consider the value of learning that resulted from TELMOOC participation.

TELMOOC Professional Development Design

In previous chapters, we have discussed in detail the design of the MOOC aspects of the TELMOOC. These discussions articulated the design, presentation, and teaching aspects of the MOOC. We now turn our attention to the design of the professional development experience embedded within the TELMOOC. This design meets what Darling-Hammond and McLaughlin described as an opportunity

for teachers to rethink their teaching and to learn in ways they likely have never experienced before. The TELMOOC PD experience was designed using the NTPD model (Ostashewski & Reid, 2010). As introduced in Chapter 6, NTPD can be defined as educator PD delivered online in a networked environment that supports and encourages teachers to learn together, both formally and informally, while allowing them to retain control over their time, space, presence, activity level, identity, and relationships. In sum, there are three key characteristics of networked teacher professional development:

1. NTPD allows teachers a technology-facilitated opportunity to develop a network of relationships which they can access to support their classroom teaching practices beyond the more formal online-delivered TPD activities.
2. NTPD provides teachers with first-hand experiential learning about online social media tools such as blogs, forums, videos, and file sharing sites, affording teachers an authentic experience of how online tools can be used in their own classrooms.
3. NTPD allows teachers to participate in professional learning that is just in time, accessible, and potentially self-guided. (Ostashewski, 2013, p. 66)

One component critical in MOOCs for PD comprises the networked learning and connections between learners that are supported by the instructional team. We spoke in a previous chapter about the importance of providing learners with opportunities to take the lead and guide the discussions. Within the NTPD framework is an understanding that educators must be able to guide and contextualise discussions with their peers. This control of their PD experience is what makes it valuable and therefore effective for teachers, resulting in changes to their teaching practices. One TELMOOC 5 participant described how much this kind of open-ended TPD can mean for encouraging new teaching practice(s):

I have been thinking of starting a blog discussing and writing about learning disabilities related topics. Attending this course has opened my eyes to so many things that will be important to setting up and managing my blog. I knew little about licensing except for giving the author credit. Now I know and understand types of licences with the CC licence systems and how to check for acceptable or restricted uses. CoI, TPACK, TIM, Unit 2-Integrating technology in education, Collaborative Learning Technologies and all other topics and resources were all useful to me and will help me to set up my blog and manage in the near future. Thank you so much to TEL instructors and Course Inspirer for the great opportunity and a wealth of knowledge. Much Appreciated.

Another TELMOOC learner pointed to specific KSAs gained as a participant, providing evidence of what Darling-Hammond and McLaughlin pointed to as rethinking one's teaching.

*This course was an eye opener for me, it has provided me with technical **knowledge** and **skills** to manoeuvre around an MOOC it has also allowed me to **comprehend** how to engage our students on an online platform. In terms of teaching **practices** I will ensure that I incorporate the use TEL in my sessions to ensure that students are acquiring information technology skills.*

As we review the aspects of professional development in this chapter, we will continue to refer to the effective TPD characteristics and the KSA elements. One of the four principles of UNESCO's (2021) Futures in Education discussion for 2050 states, "A strong professional identity for teachers should be encouraged. This includes proper induction and ongoing professional development that ensures teachers can effectively use their judgment and expertise in designing and leading student learning" (p. 90). We believe the TELMOOC is an example of effective and sustainable TPD that can support the development of strong professional identity for teachers. Furthermore, Laurillard (2016) indicated in her study of MOOC effectiveness for TPD that the MOOC pedagogy fits well and has the power to tackle the problem of large-scale TPD needs. Next, we turn our attention to answering the research question guiding this chapter.

TELMOOC Value in Education Practice

The research question we will explore in this chapter is *What value do learners indicate the resources, discussions, and activities have for their technology-enabled education practice?* A presumption inherent in this question is that if educators value elements of the TELMOOC, this means they perceive those elements as having value or informing their professional practices in a positive manner. When looking at the PD aspect in the TELMOOC, we can describe the intended PD learning using three separate elements of Reh's (2017) KSA framework:

1. Knowledge element: experiential learning about technology, TEL, CoI applications
2. Skills element: participating in teaching and education using technology
3. Ability element: viewing and discussing teaching challenges and solutions with other learners

Exploring some of the data collected and analysed from the TELMOOC deliveries will provide examples of what value educators ascribe to the course.

Interpretation of Participant Responses

During the final week of TELMOOC 4, the course inspirer posted a question to the discussion forum, asking participants to share what they had learned or felt was most valuable for their teaching practice. The following describes the methodology of our analysis:

A total of 178 participants posted a reply in this forum, most of whom did so within 48 hours of it being posted. This convenience sample of participants provided 178 responses in total, of which 162 or 91% were valid responses to the question posed (16 answers were discarded). The 162 valid responses were analyzed, and four codes emerged from an initial round of coding where 231 distinct code instances were identified. The four codes were: learned more about TEL, improved TEL teaching practice, learned about OER, and gained confidence with TEL. (Cleveland-Innes et al., 2020, p. 129)

In Table 7.1, we present the findings previously reported and indicate how they correlate to the elements of the KSA framework. TELMOOC participants reported that the two main areas where knowledge they gained in participation had value for their teaching practice were *learning more about TEL* and *learning about OER*. As well, participants reported that their *TEL teaching practice*, what we view as a KSA ability, was the most valued outcome of their TELMOOC participation.

Table 7.1. A KSA comparison with what TELMOOC participants reported had the most value for their teaching practices

Reh's KSA Framework	Code	Code instances	Percentage of total codes
Knowledge	Learning more about TEL	79	34%
Knowledge	Learning about OER	61	26%
Skills	Gaining confidence with TEL	8	4%
Ability	Improving TEL teaching practice	83	36%
Totals		231	100%

The TELMOOC post-course survey results provided over 1,500 responses. In this post-course survey, participants were asked about their agreement with the following four statements, providing insight into the knowledge elements participants indicated they valued:

1. TEL MOOC discussions provided me with information about resources that I will be able to use in my own teaching.
2. The quizzes helped to test my knowledge.
3. The course material was of good quality.
4. Assignments were helpful to acquire knowledge and skills.

Figure 7.1. presents the analysis of the Likert-scale responses to these four questions.

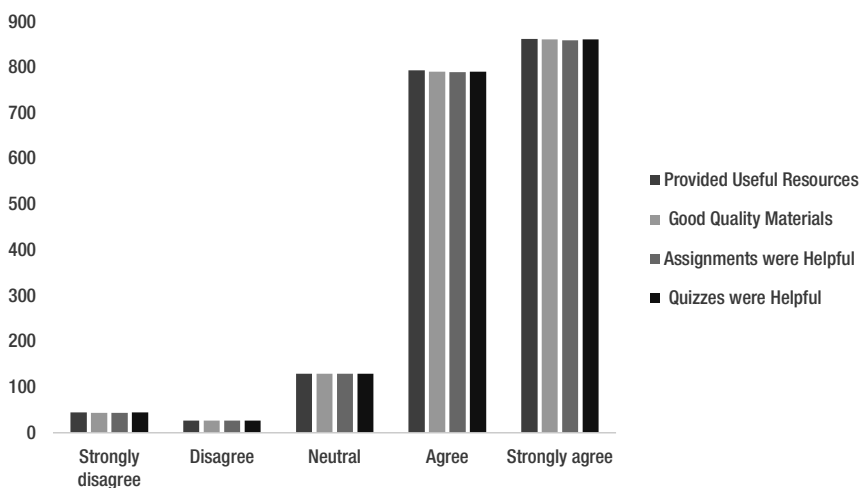


Figure 7.1. TELMOOC Post-course survey responses to knowledge element value.

Ninety-five percent of TELMOOC participants who completed the post-course survey strongly agreed or agreed that the knowledge they were exposed to contributed to their learning about the course topics of TEL and OER. This indicates that educators did feel the knowledge component of the TELMOOC met their expectations and provided what they found would support their teaching practice. Further details of the PD effectiveness can be found by examining the themes in statements from TELMOOC participants when they described this value. As indicated earlier, the inspirer posted the discussion forum prompt “Please share with us what you have learned or feel will be most useful/valuable for your teaching practice” in both TELMOOC 4 and TELMOOC 6. Some of the replies provide insight about this knowledge element, such as these comments from participants who identified specific topics as being useful. The OER-TIPS (Kawachi, 2014) resource is one example of such a resource:

I've really come to appreciate the usefulness of technology in education when used properly. There were many useful facts and information that has transformed my view of technology in education, especially how some of my students may be left behind by the types of technology that I may choose. The TIPS model and the consideration of the different pedagogical views has given me a different perspective on how I meet the needs of my students.

Hello from Jamaica!! I truly appreciated this course as I learned a lot about technology integration in my lessons, and most importantly, the different types of technology that I can use. I used to think that technology meant only the internet, but now I realize that it can be as simple as a document, so I feel more confident and comfortable now to integrate technology in my lessons, despite limited resources. Thank you to the TEL MOOC team for this opportunity!!

I have learnt a lot and being my first time to have online course, it has really impressed me, and I have never had a chance to access live video lessons before. It's my first time to come across to types of Licenses and this will make me keep on researching and know them better after the course.

These learner comments provide examples of resources (the TIPS framework, OER licensing) participants valued in the TELMOOC. Instructor-led activities like outdoor video clips and live sessions were also identified by one participant as high value.

The Inspirer was very beneficial. This moved the course from a monotonous slides and content to a feeling of being outdoors and visiting another place. Also beneficial was the linkages made by the Inspirer to the course. It deepened the perspectives. The videos provided the information and the READ EXPLORE REFLECT... provided great opportunities to expand and enrich my understanding and interest. This was a great layout for the course. During the live sessions I appreciated Daniels sharing of the additional linkages as participants asked questions. This was great added value.

One theme identified by participants was the value of knowledge gained from TELMOOC activities related to the sudden move to online and blended learning caused in 2020 by the global pandemic. The TELMOOC was delivered three times in 2020 and twice in 2021 as part of the COL and AU pandemic support response for educators as they moved teaching out of the physical classroom setting. Educator challenges are well documented, as “throughout much of the world during the pandemic, teachers experienced stress and burnout as a result of inadequate technological platforms and professional development to support remote learning effectively” (UNESCO, 2021). The TELMOOC is an example of TPD that provided meaningful support, according to these two educators:

This course has been very helpful to me. It came at the opportune time as educational institutions migrated online because of the pandemic. Teachers, not trained in the use of technology were forced to use them and untrained students had to learn remotely. I have learned some many things about the use of technology in teaching as well as the resources available. I appreciate the volume of resource materials that were made available to the community. I am now able to better share with my students and colleagues. Thank you for sharing your time and knowledge. This was a well-organized and interesting course.

TELMOOC has made me reflect on the fact that the move towards online learning is one that I am continuously striving to keep up with, and this has been accelerated given the new methods of instructional delivery during the pandemic. Whether in-class, hybrid, or online learning, we are in a new normal and teaching and learning must be on the cutting edge of times like these.

TELMOOC Discussions

Discussions with other learners is another area identified by TELMOOC participants as important. Research by Koukis and Jimoyiannis (2017) about high levels of MOOC completion and TPD relate how important discussions are. Their research identified that educators

were mainly driven by their opportunities for peer interaction and peer support towards achieving common goals. Therefore, teachers’ active participation in discussion forums is suggested as a key component towards designing successful MOOCs for teacher professional development. (p. 278)

This is made evident in the following participant statement.

I found the TELMOOC very interesting. It had interactive lessons and quizzes which motivated me to read and do well! Furthermore, collaborating with online learners via the discussion forums was indeed eye opening. Especially learning the context of fellow learners.

The value of authentic discussions and activities for effective TPD is evident throughout the TPD literature (Darling-Hammond & McLaughlin 2011; Dron &

Ostaszewski, 2015; Herrington et al., 2003). “Professional development must allow teachers to share what they know and what they want to learn and to connect their learning to the contexts of their teaching” (Darling-Hammond & McLaughlin, 2011, p. 81). The findings of some of our other research (Ostaszewski, 2018) is further supported by comments made by learners in later deliveries of TELMOOC.

Results indicate that participant discussions, resource sharing, and peer support deepened of the topics presented in the MOOCs. In addition when educators have opportunities to view how other educators engage in online activities, they broaden their understanding of how online technologies can be used to support learning. (p. 230)

Findings such as these further redoubled the instructional team efforts in later TELMOOC deliveries to continuously encourage learner-driven conversation and discussion. The instructional team weekly discussed how forums could be further connected to content or topic leaders’ discussions could be brought to the attention of other learners. One example was an early TELMOOC use of teaching analytics to identify thought or discussion leaders (Ostaszewski et al., 2018). Understanding that the connections learners create between the information they are exposed to and theirs and others’ contexts of practice is key to the success of the TELMOOC. Another way the TELMOOC was unique in this area of supporting authentic discussions was by explicitly asking learners to create discussion forums for questions they wanted answered about TEL practices. This transition of learning control onto the learner is similar to what happens in cMOOCs (Dron & Ostaszewski, 2015), where learners drive the conversations in directions that have benefit for them. One theme of these kinds of learner-created topics that repeated in all the TELMOOCs was the challenge of implementing TEL with limited devices, the lack of access to high-speed Wi-Fi networks, and other funding-related problems.

As the TELMOOC deliveries progressed, the instructional team also began to become more explicit with learners about the learner-created discussion forums, as well as their postings in the course-created discussion forums. Learners were told and reminded that while the instructional team had some answers to their questions about TEL, the participants themselves had experience and expertise that could be accessed. The instructional team would often remind learners that the course content also included all of their discussions and posts, as those various perspectives could be of value to other learners. Research conducted by Hartnett et al. and Dron (2011) pointed to three specific manners in which such authentic discussions can even support learner motivation. Hartnett et al. (2011) stated that by structuring discussions to be relevant and to offer options and frequent communication, learner motivation to participate can be supported:

1. The relevance and value of the task (e.g., online discussions) need to be clearly identified and linked to learning objectives to help learners understand how the activity can aid in the realisation of personal goals, aspirations, and interests, both in the short and longer term.

2. By offering meaningful choices (i.e., not just option choices) to learners that allow them to pursue topics that are of interest to them, the perceived value of the activity is further enhanced.
3. By establishing frequent, ongoing communication with learners, where they feel able to discuss issues in an open and honest manner, practitioners are in a better position to accurately monitor and respond to situational factors that could potentially undermine learner motivation. (Hartnett et al., 2011)

Similar research (Salmon et al., 2017) providing more-specific design suggestions for MOOCs further emphasised the high attention that should be paid to authentic learner discussions. Salmon et al. (2017) spoke to contextualised course interactions as key; according to their findings, the following components need to be identified early when designing MOOCs, as they directly impact the pedagogical design and plan of the entire MOOC experience:

- Build clear scaffolding so that self-motivation based on achievement is frequent and progress obvious;
- Establish clear responsibilities amongst participants to sustain their engagement in their groups, if such pedagogical processes are used;
- Encourage participants' articulation and explorations of their expectations and motivations at clear points throughout the scaffold;
- Identify typical participant cohorts and their likely desired expectations of the process of the MOOC, especially the behaviours of other participants, offer alternative pathways;
- Identify typical participant cohorts and their likely range of motivations, and, if in a large MOOC, offer different pathways through the materials to account for different motivations and expectations;
- When describing the benefits, go beyond the "content" of the MOOC to be clear about the learning process and commitment;
- Encourage participants' reflections and articulation of unexpected and emergent benefits of their continuing commitment to the MOOC;
- Ensure opportunities for constant review of how relevant the content is to practical applications – this can be achieved by allowing for personalisation and contextualisation of the learning material and assessment. (Salmon et al., 2017, p. 1290)

Other design considerations that have been highlighted in the literature (Darling-Hammond & McLaughlin, 2011; Hartnett et al., 2011; Salmon et al., 2017) focus on authentic, contextualised discussions by MOOC learners. This brings us back full circle to the NTPD design implemented in the TELMOOC, specifically to where NTPD is "delivered online in a networked environment which supports and encourages teachers to learn together, both formally and informally" (Ostashewski, 2013, p. 66).

One final thought about discussion and the Interaction Equivalency Theorem (Miyazoe & Anderson, 2014) as it relates to MOOCs. We believe that all three elements of interaction (learner–learner, learner–teacher, learner–content) do in fact need to be present in a sufficient amount. Some researchers support the idea that costs or quality can be interchangeable. Our iMOOC model provides one example

where all interactions (in the form of discussions, for example) can be supported at scale without the enormous costs associated with high-quality online learning. The importance of this can be identified in the collaborative and empirical study, “An Exploration of the Relationship Between Indicators of the Community of Inquiry Framework and Retention in Online Programs,” (Boston et al., 2009) which finds that students experiencing effective social interactions are most likely to persist from one semester to the next. In essence, discussions lead to completions.

TELMOOC Activities

According to participants, *TEL teaching practice*, which we indicate is a KSA ability (see Table 7.1), was the most valued outcome of their TELMOOC participation. One participant’s comment describes the outcome of TELMOOC for their practice:

The lesson learnt here is going to be of much use in my teaching because now I am enabled to use technology in a better way in my classroom interactions with my learners.

In the post-course survey, 1,744 of 1852 participants responded (94.2%) they agreed or strongly agreed with the statement “The TELMOOC experience will assist in the use of TEL.” In Figure 7.2, we present data that shows the high level of agreement with the statement.

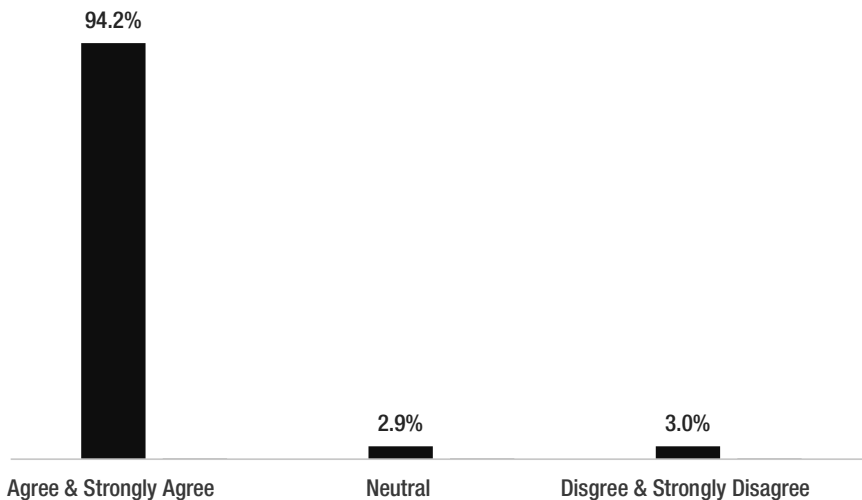


Figure 7.2. TELMOOC Post-course survey responses to “TELMOOC will assist with use of TEL.”

While these are self-reported data, participants as educators confirmed the effectiveness of the TELMOOC as having high value to their practice. Participant statements that provided some details were found in the inspirer discussion forums, and they highlight that modelling and activities in the course were key to its value. The following two participant comments indicate a significant change in their teaching practices:

From the course, I can develop better content, develop ways to engage student (has always been the biggest challenge to me) and plan my lesson efficiently. I realized that before as a teacher I have been doing all the work and just leaving reading only to students, now I believe I am a better teacher and a good student too.

One useful and valuable teaching style I learned in this course is the simple, fancy but genius lesson plan activity where we introduce our students by VIDEO, then READING, REVIEW, and RESPOND. This is revise version of our 'stone-age' lesson plan where we have INTRODUCTION, BODY, CONCLUSION and ACTIVITY.

These comments align with what Darling-Hammond and McLaughlin (2011) described as effective TPD, where there is a significant rethinking of teaching practice as a result of TPD participation. New ways in which to engage students, including new classroom roles and expectations about students, are clearly indicated in these two participants' comments.

One final way we can consider the value participants placed in the TELMOOC activities is to analyse their participation in the course assessment described as the TEL Activity Plan. This assessment, graded based on a pass/fail metric, asked learners to create a lesson or lecture plan that demonstrated an understanding of TEL integration. It can be presumed that if TELMOOC participants felt there was value in such an activity, they would complete the activity. As mentioned when we presented the discussion design and outcome in the previous segment of this chapter, authentic activities are key to adult learner motivation and participation.

Learners who completed TELMOOC activities became eligible to receive one of two certificates: a Certificate of Participation or a Certificate of Completion. In order to receive a Participation Certificate, TELMOOC learners must have passed all course quizzes with an average grade of 80% and contributed five or more substantive posts in the course discussion forums. Posts that were not substantive included single words or phrases that were under five words in length, as these were not considered to be meaningful participation. To be eligible for the Completion Certificate, learners must have completed the Participation Certificate criteria and received a pass on the instructor-graded TEL Activity Plan, which asked learners to develop their own contextualised TEL teaching plan for a single educational activity. These plans were graded by the course instructor, and where submitted plans were incomplete or received a fail, learners were provided with an opportunity to revise and resubmit the assignment.

Table 7.2 indicates the total numbers of TELMOOC participation and completion certificates awarded across all ten iterations of the course. The percentage of completion certificates column in Table 7.2 is calculated as # of completion certificates / total # of certificates awarded. While these data are not related to the completion rate of the TELMOOC, they provide an understanding of how much learners valued the higher-value certificate (which required more work). It is clear that across the ten TELMOOC deliveries, the learners highly valued this final graded assessment.

Table 7.2. TELMOOC certificate types awarded

MOOC#	# of participation certificates	# of completion certificates	Total # of certificates	% completion certificates
1	18	89	107	83.2%
2	349	347	696	49.9%
3	102	270	372	72.6%
4	154	531	685	77.5%
5	113	386	499	77.4%
6	80	366	446	82.1%
7	75	325	400	81.3%
8	86	244	330	73.9%
9	23	81	104	77.9%
10	20	50	70	71.4%
Totals	1,020	2,689	3,709	72.5%

Of the 3,209 certificates awarded to learners, 72.5% were completion certificates, which required the additional assignment. This speaks to the high value learners placed on the submitted assignment, which was designed as an authentic application of the TELMOOC KSAs that were presented to learners. Herrington et al. (2003) in their research on teacher education described ten characteristics of authentic activities, and one of their definitions of authentic activities is the basis for our inclusion of such an activity in the TELMOOC. “[A]uthentic activities as tasks: that have real world relevance and utility, that integrate across the curriculum, that provide appropriate levels of complexity, and that allow students to select appropriate levels of difficulty or involvement” (Herrington et al., 2003, p. 62).

In the TELMOOC, the TEL Activity Plan assessment is authentic in two specific ways: first, as a meaningful and relevant activity — which is what adult learners care about — and secondly, as a contextual activity intended to be an educational plan that they design to be implemented in their own teaching context. As our 72.5% TEL Activity Plan participation by TELMOOC learners indicates, our TPD again meets the descriptions of effective TPD that develops meaningful KSAs for learners. Of further note, the TEL Activity Plans met one other objective of authentic tasks, in that their relevance was evident to learners. This was because the creators of successful TEL Activity Plans were given the opportunity to have them published as OER on the website Technology-Enabled Learning Resources (<http://telresources.org>), as part of the closing activity for any TELMOOC participant who was willing to share their plan. In a real sense, the opportunity for TEL participants to contribute their work to a persistent online OER repository completed the circle of creation and sharing of OER made possible in the TELMOOC. The TELMOOC, composed entirely of OER resources, showcased how OER could be utilised in a course and then finally be created as an outcome of TELMOOC

participation. This certainly is an example of how experiential learning can be implemented in a full circle of OER use–create–share. We hope that our model of NTPD within a MOOC can be of assistance to others planning TPD activities. Further, we would say that blended in-service activities using an online and offline component offer another way to provide effective TPD.

Conclusion

We have seen throughout this chapter that the TELMOOC design as an NTPD activity has been reported by participants to be highly effective, resulting in NTPD that supports valuable KSA development. This conclusion is supported by an external evaluation of the TELMOOC commissioned by the COL in 2020. The external evaluation consisted of a mixed-methods study of 214 TELMOOC participants, conducted after the fourth delivery. The evaluation (Perryman, 2020) reported that TELMOOC was valuable as an NTPD activity (Ostashewski, 2012), meeting and exceeding the criteria that Darling-Hammond and McLaughlin (2011) set out for effective TPD. These NTPD and effective TPD criteria are compared in Table 7.3 to the evidence detailed in the COL (2020) report.

Of particular importance in this COL (2020) report is the finding that TELMOOC effects were long lasting and even had some multiplier effect on a global scale.

TELMOOC participants report increased collaboration with colleagues in their own institution and beyond, leading to a multiplier effect whereby knowledge, skills and resources are shared with those peers who, in turn, often begin experimenting with TEL and OEP in their own practice. TEL MOOC participants also report a positive impact on their learners' study outcomes, including improved grades and engagement, increased attendance at school/college and increased retention. (COL, 2020, p. 72)

This review of TELMOOC highlights and supports other research findings about the potential value of MOOCs for providing TPD. According to Misra (2018), MOOCs for teacher PD will help teachers to:

1. observe how others teach online
2. join community conversations about topics that interest them
3. e-live the student experience – online
4. learn something new in a structured way
5. find well-chosen (mostly free) resources on a topic or sub-topic (p. 75)

One final testimonial from a TELMOOC participant makes the point of how transformative the knowledge, skills, and abilities learned in the course were:

I am glad I took up this course. It increased my horizon of teaching like how a particular concept can be taught with so many different angles. By the use of technology, new methods of teaching are brought up and these methods are loved by the students which also includes their involvement. Thus the teaching shifts from lecture methods to hands on experience methods where there is involvement of the learner as well.

Table 7.3. Evidence of effective NTPD as an outcome of TELMOOC participation

Effective NTPD criteria	Findings from COL evaluation study (2020)
Teachers rethink their own practice (Darling-Hammond & McLaughlin, 2011)	Over 90% reported use of a wider range of technologies to support teaching and learning, and a wider range of multimedia, and just under 90% reported increased use of OER, broader curriculum coverage, use of a broader range of teaching and learning materials, use of a broader range of teaching and learning methods and increased experimentation with new ways of teaching (p. 35)
Teachers can construct new classroom roles and expectations about student outcomes (Darling-Hammond & McLaughlin, 2011)	MOOC has resulted in attitude and behaviour changes for participants in a variety of roles – including educators, managers and researchers – across many different education sectors, levels and formats, and in an equally diverse range of geographical settings (p. 5)
Teachers learn to teach in ways they have never taught before (Darling-Hammond & McLaughlin, 2011)	Participants report increased positivity about the value of TEL and of OER, increased confidence in implementing new technologies and pedagogies and in adopting open educational practices, increased willingness to experiment with new teaching and learning methods, and increased reflective practice as education professionals (p. 5)
Teachers develop a network of relationships which they can access to support their classroom teaching practices (Ostashewski, 2013)	A teacher reported that he has clearly gained much from the experience of being part of the TEL MOOC learner community and has applied his networking skills to connect with peers around the world (p. 62) Participants have welcomed the opportunity for knowledge-sharing within that network, the opportunity to learn networking skills from their peers and from the course facilitators, and the chance to practice those skills by being part of a massive online cohort of learners. Participants' subsequent use of online networks to further develop their practice and openly share resources has been repeatedly mentioned, again demonstrating the potential of TEL MOOC to achieve impact, including capacity building, on a global scale through a multiplier effect. (p. 68)
Teachers use technology tools in an authentic experience of how online tools can be used in their own classrooms (Ostashewski, 2013)	A teacher reported that experience of participating in open online spaces has influenced the teaching strategies she adopts with her students (p. 58)
Teachers participate in professional learning that is just in time, accessible, and potentially self-guided (Ostashewski, 2013)	Teachers give extensive evidence of changed practice resulting from their study of TEL MOOC, including experimentation with new technologies and pedagogies, use of open educational practices, and increased reflection on their own teaching. The TEL Activity Plans are repeatedly mentioned as being shared with colleagues as a focus for discussion of TEL implementation, indicating their value as an important component of the course (p. 68)

While it this chapter may appear simply to be providing evidence of the TELMOOC's success, this is not its goal. This chapter provides details that share how the TELMOOC was designed and why the design elements worked to provide effective TPD. More important to us is that this book provides a roadmap that other designers can follow for their construction of MOOCs or NTPD, professional learning in-services, and perhaps even formal education delivery. Post-pandemic education is changing because of the newly discovered options and affordances that TEL can bring to all levels of education. The chapters in this book are also a roadmap that educators, administrators, and trainers can follow to design, deliver, or support effective and meaningful technology-enabled learning. We look forward to continuing the discussion of our TELMOOC research findings as they are completed over the next few years. Specifically, research into the roles of the inspirer and facilitators (in essence, the live teaching roles) is being conducted and may shed light on how the changing role of educators is evolving.

Summary and Recommendations

Summary

The previous chapters outline the inception and evolution of the massive open online course (MOOC) *Introduction to Technology-Enabled Learning*, (TELMOOC) and its place in the wider education innovation space. The course has evolved over five years and the completion of ten different iterations (TELMOOC1 to TELMOOC10), five of which were delivered during the global Covid-19 pandemic.

This evolution included numerous technical and procedural changes because of research and practice resulting from each iteration. The technical change began with a change in MOOC delivery platform from mooKIT (1–4) to Canvas (5–10). Another was the increased use of weekly synchronous sessions that supported technical issues (how to create a TEL Activity Plan), learner understanding and extension of topics (OER session in Week 3), and opportunities for Q&A segments with the instructors. These Q&A segments of the synchronous sessions quickly made up half of the time available for the session, as learners commented on the significant value of these interactive activities.

Some of the procedural changes were at the instructional team level, where the roles of inspirer, technical administrator, and facilitators became much more defined and effective over the ten iterations. The role of inspirer became more focused with the cueing and prompting of weekly activities, in addition to providing a “live” instructor that was part of the ongoing weekly activities. For example, by TELMOOC 8, the inspirer eventually became the host and lecturer for all the synchronous sessions, specifically because of that person’s ability to engage with Q&A discussions afterward in the asynchronous forums. Recordings of the synchronous sessions were viewed by numbers much greater than the numbers of those able to attend the sessions in real time. Procedural changes were also made

to the role of facilitators. Over time, the facilitator role became focused on connecting participants and roving among the discussion forums, adding an active and engaging touch to the otherwise content-focused environment. This became increasingly important, as in this engaging MOOC design, participants and their questions, answers, and even self-initiated forums became fully understood as part of the *content* of the TELMOOC. Facilitators were key for encouraging learners to participate in meaningful ways that contributed to their overall engagement in the TELMOOC.

The scaled Community of Inquiry pedagogical approach provided a steadfast orientation to two premises: (1) encouraging participant contributions to the course content, design, and delivery (otherwise known as high levels of cognitive and teaching presence), and (2) connecting and interacting with peers and staff (known as social presence). Using the iMOOC structure, the scaling of engagement and interaction with the teaching team supported learners effectively and contributed to their overall success — so much so that the certification rates of the TELMOOC (regardless of the scale used) were significantly higher than the MOOC average. In keeping with UNESCO's recent report on the future of education, collaboration is central not only to achieving learning outcomes but as a skill development opportunity for competence much needed for lifelong learning and working in a digital world.

Offering a course about the use of technology during a pandemic added an energy and level of participation unprecedented in past TELMOOCs. Not to be ignored, the lived pandemic experience in education and beyond was an added topic in the content, synchronous sessions, and discussion forums. Reminders of the evolution of technology and learning over decades provided opportunities to ground the experience in past research and practice. Emergency remote teaching and learning provided naïve use of technology as a blunt-edged instrument to reach students while keeping them safe. The lack of teacher and student preparation left many experiencing a frustrating and dissatisfying experience. The pandemic takeaway, however, is the importance of preparing all students to learn, whether online or in a physical classroom, or perhaps using both in blended learning implementations. Technological tools, combined with independent and collaborative working opportunities, should be brought back to the physical or hybrid classroom in conjunction with online pedagogical approaches that increase active, collaborative learning and learner-generated choices.

Recommendations

Based on our TELMOOC design and delivery experiences that have been articulated throughout this book, we make the following recommendations:

A. For MOOC Reporting and Research

Publish MOOC completion rates based on actual learners who engage with the course (fully active learners), and report three categories of learners instead of one:

1. Registrants: participants who register for the MOOC

2. Active learners: participants who log in and explore but do not engage past introductory activities (Week 1, for example)
3. Fully active learners: committed learners who continue to engage with the MOOC activities beyond the first “try and see if it fits” introductory activities

B. For MOOC and Online Course Design

- Consider the iMOOC model, which focuses on peer–peer interactions that develop a CoI (with three tiers of instructional presence).
- Pacing instruction weekly, so that the conversations are being experienced by learners as a group, is key to developing and sustaining a community.
- Provide as much flexibility as possible in regard to assessments and time-lines so they will not interfere with pacing and completion.
- Examine the PAGE framework (Table 8.1) for MOOC or online design elements to consider that can best support learner success (pedagogy, attributes of learners, goal articulation, engagement).

Table 8.1. PAGE success framework for MOOCs

The PAGE success framework for MOOCs: 4 pillars			
Pillar	Measure	Alignment	Evidence
Pedagogy	xMOOC	Knowledge duplication	
	iMOOC	Knowledge integration & sharing	
	cMOOC	Knowledge creation & sharing	
Attributes of learners	Demographic	Alignment with needs	
	Intention	Time-barrier accommodations	
Goals	Promoted goals	Formal learning objectives	
	Course objectives	Professional development	
		Personal interest	
Engagement	Learner–teacher	Asynchronous and synchronous sessions	
	Learner–learner	Teacher Q&A with learners	
	Learner–content	Weekly announcements	
		Discussions (teacher/learner led)	
		Collaborative activities	
		Auto-graded quizzes	
		Assignments	

C. For Online Educator PD

- Share educator experiences.
- Provide for plenty of networking and active engagement with other educators.
- Have authentic artifacts be an outcome of course participation (e.g., a plan of some sort).

D. For MOOC Instruction

- Develop short video lectures (under five minutes).
- Have synchronous sessions weekly that include short lectures (20–25 minutes) and Q&A opportunities (35–40 minutes).
- Facilitators’ main task is to connect learners to each other through:
 1. encouraging learners to join ongoing discussions (that the facilitator links to)
 2. connecting learners to the content that supports their discussions
 3. asking learners to elaborate so that others can join their discussion
- Inspire learners with a weekly introduction that provides a personal context, anecdote, or analogy for the content to be covered.

Future Research

TELMOOC research will continue over the next two to three years. Continued examination of the PAGE framework, as a CoI-compliant MOOC design and delivery model, will be a central focus. Analysis of discussion forum content is expected to identify critical issues in teaching development stages, and the needs of educators as they evolve into digital participants in technology-enabled learning opportunities. Further articulation of the iMOOC active instruction roles of inspirer and facilitator who support scaled implementation of the CoI is expected as an outcome of additional research.

General MOOC research requires the following (Moreno-Marcos et al., 2018; Zawacki-Richter et al. 2018):

- examination of MOOCs as formal credit-based education delivery
- MOOC platform useability, quality, and cost
- MOOC accessibility for diverse content, languages, and learners
- quality learning experiences and outcomes through (i) MOOC design and delivery and (ii) teaching and learning design, and resulting quality issues.

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About the Authors

Dr Nathaniel Ostashevski is Associate Professor of Open, Digital, and Distance Education at Athabasca University in Alberta, Canada. He teaches graduate courses in distance education research design, educational technology, and online and blended learning. He has been utilising digital technology in teaching since 1990, at both the K-12 and graduate education levels. Since 1995, Dr Ostashevski has been training educators in how to incorporate technology-enabled learning into “worth-it” classroom, blended, and online activities. Working at universities in Australia and Canada, he has been developing and researching MOOC designs that incorporate community of inquiry and networked learning approaches since 2009. His research interests, which have been shared in over 90 publications, include technology-enabled learning and pedagogy; online and blended learning; OERs; networked teacher professional development; and MOOC design and delivery. His extensive experience with digital media for education, online and blended instructional design, and online teaching strategies — which he is most willing to share with others — can be found in the MOOCs he designs and teaches. Some of his most recent projects include the TELMOOC and the Community of Inquiry in Online Learning MOOC.

Dr Martha Cleveland-Innes is Professor of Education Innovation at Athabasca University. She is the Editor-in-Chief of the bilingual *Canadian Journal of Learning and Technology*. Martha is also the author of *The Guide to Blended Learning* and is an instructor, co-designer, and researcher for the open online courses Blended Learning Practice, and Leading Change for Teaching and Learning in a Digital World. The second edition of *Introduction to Distance Education: Teaching and Learning in a New Era*, which she co-edited, was released by Taylor & Francis in 2021. She has held major research grants supporting research on the technology-enabled student experience. In 2019, Martha received an honorary doctorate from Mid-Sweden University and the Leadership Award from the Canadian Network for Innovation in Education. She is co-creator of the Community of Inquiry Research Repository, found at <https://www.thecommunityofinquiry.org>. Her research interest areas include online and blended learning; communities of inquiry; higher education reform and lifelong learning; and leadership in education. Martha is currently Visiting Professor of Pedagogy at Mid-Sweden University and has accepted a supporting post as Virtual Educator-in-Residence at the National University of Singapore for Fall 2022.

The *Introduction to Technology-Enabled Learning MOOC* (TELMOOC), a massive open online course developed by the Commonwealth of Learning and Athabasca University, was offered ten times between January 2017 and July 2021. The purpose of TELMOOC was to provide an accessible learning opportunity to teachers, particularly for those in the global south, to expand upon their knowledge and skills regarding the use of technology and open educational resources in teaching and learning. Designed with the inquiry MOOC (iMOOC) model that complies with the Community of Inquiry framework, the TELMOOC has been successful as a large-scale educational implementation. This book presents a critical perspective into the design and delivery of the TELMOOC. Of particular interest to administrators, educators, and instructional designers is the descriptions and outcomes of the course from the view of the participants. How and why the course interactions were incorporated to descriptions of new educator roles are included in this research-based book that intends to provide a roadmap for others to follow. Articulated in the book is a proposed way in which MOOCs completion rates may be reported as well as an introduction to a holistic quality framework for MOOCs (The PAGE MOOC Success framework). Finally, an evidence-based model of online-delivered teacher professional development for MOOCs is outlined showcasing the experiential opportunities provided to educators in the TELMOOC.

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