



## Technology-Enabled Learning and the Benefits and Challenges of Using the Community of Inquiry Theoretical Framework

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**Abstract:** The Introduction to Technology-Enabled Learning (TEL)MOOC was intended to engage teachers worldwide who work in any level of education and are interested in technology-enabled learning and Open Educational Resources. This paper investigates the response by participants from post-secondary educational institutions to the content presented in week one of the (TEL)MOOC on the Community of Inquiry (CoI) model, in particular, the benefits and challenges of using the CoI framework in the classroom, whether it is online, blended or face-to-face.

**Keywords:** MOOCs, Community of Inquiry (CoI), technology enabled learning

**Résumé :** L'introduction du MOOC sur les technologies pour l'apprentissage visait à engager des enseignants du monde entier qui, quel que soit le niveau auquel ils enseignent, s'intéressent aux technologies pour l'apprentissage et aux ressources éducatives libres. Cet article traite de la réponse donnée par les participants au contenu présenté dans la semaine une, sur le modèle de la communauté d'apprentissage, en particulier les bénéfices et défis accompagnant l'usage du cadre de la communauté d'apprentissage dans la salle de classe, que cela soit en ligne, hybride ou face-à-face.

**Mots-clés :** CLOMs, Communauté d'apprentissage, Technologies pour l'apprentissage

### Introduction

Massive Open Online Courses (MOOCs) are still considered a relatively new form of online learning, one that was implemented ahead of significant consideration of teaching and learning principles appropriate to large numbers of online learning participants. The MOOC, Introduction to Technology-Enabled Learning, is designed for teachers in diverse contexts: secondary education, post-secondary education and vocational education. The course benefits those teaching face-to-face or in a distance/online environment. In this course, teachers build knowledge and practice in teaching and learning with technology. It runs over five weeks and requires approximately three to five hours of engaged activity time each week. Designed to accommodate teachers' busy schedules, the course is



flexible and convenient with learning activities that include readings, videos, discussions with other participants and instructors, meaningful exercises, quizzes and a short assignment. Two types of no-fee certificates are available for those who wish to complete the various activities and quizzes.

The inaugural (TEL)MOOC was held from January 9 to February 10, 2017, using the mooKIT platform developed by the Indian Institute of Technology, Kanpur and used by the Commonwealth of Learning. Throughout Week One, learners explored technology-enabled learning activities that made use of a range of educational technologies. These included successful learning approaches implemented by educators in various teaching contexts, open and available resources that support technology-enabled activities, and teaching presence in the context of technology-enhanced learning environments. Content in Week One of (TEL)MOOC included a presentation and readings about the Community of Inquiry (CoI) theoretical framework. Participants were asked, as part of that unit of study, to outline the benefits and challenges of using the CoI framework within online, blended or face-to-face classrooms. Responses to this question formed the basis of this study.

This paper discusses the benefits versus the challenges offered by participants when asked about the CoI as a way to understand technology-enabled learning for their students. Particular benefits will be explained, from the most commonly cited to minor benefits mentioned, as well as the most commonly experienced challenges to less experienced or least important challenges cited. As the CoI is one conceptual framework which supports the use of technology-enabled learning, the data demonstrates this overlap at times; the benefits and challenges refer specifically to the CoI concepts and, at times, the broader elements of technology-enabled learning in which the CoI framework is employed. Ultimately, preliminary findings from this study will help expand teaching and learning perspectives and possibilities for educators and learners alike.

## **Background**

There is evidence of increasing amounts of online learning delivery (Bates, 2018; Allen & Seaman, 2016) reshaping higher education through Web-based content delivery and interaction. According to Pond (2002), “neither the purpose, the methods, nor the population for whom education is intended today, bear any resemblance to those on which formal education is historically based” (n.p.). The shift to online and blended teaching and learning provides new opportunities for content delivery, interaction, and facilitation of learning. The success of online or blended learning delivery is, to a large extent, dependent on the knowledge, expertise, support and leadership available in the transition to this new way of learning. In addition, quality teaching is a long-standing challenge in higher education where faculty are not certified to teach. In order to use online and blended learning but maintain or enhance quality teaching, more work to identify, disseminate, and implement best practices is required.

A recent Massive Open Online Course (MOOC) was designed and delivered as one step in this direction. As mentioned previously, MOOCs are still considered a relatively new form of online learning, one that was implemented ahead of significant consideration of the application of teaching and learning principles appropriate to large numbers of online learning participants. Gasevic, Kovanovic, Joksimovic, and Siemens (2014) point out this lack of instructional rigor in early MOOC development. They also suggest it is difficult, if not impossible, to apply existing social learning frameworks to the environment of a MOOC due to its scale. However, others suggest that productive, scaled, online learning environments can be constructed with appropriate learning activities, instruction, facilitation, and support, even where participating learner numbers are large (Cleveland-Innes, Briton, Gismondi, & Ives, 2015). (TEL)MOOC has been a test of this premise.

The Introduction to Technology-Enabled Learning, or (TEL)MOOC, is a collaborative project between the Centre for Distance Education at Athabasca University, Alberta, Canada, and the Commonwealth of Learning (COL), based in Burnaby, British Columbia, Canada. This MOOC is intended to engage teachers worldwide, and teachers who work in any level of education and are interested in learning more about technology-enabled learning.

## **Literature Review**

The Community of Inquiry (CoI) theoretical framework (Garrison, Anderson, & Archer, 2001) is the most widely referenced and arguably the most widely used model for constructivist-based technology-enabled learning design due to its simplicity and versatility (Anderson, 2016). It provided both the foundation for design and guidance for the instructional processes in the 2017 (TEL)MOOC, as well as being the core course content for Week One.

CoI illuminates teaching and learning in any delivery method based on learning theory and practice, and supports guided inquiry and deep meaningful learning. The framework (Garrison, Anderson, & Archer, 2001) provides support for content delivery and learning processes for this MOOC.

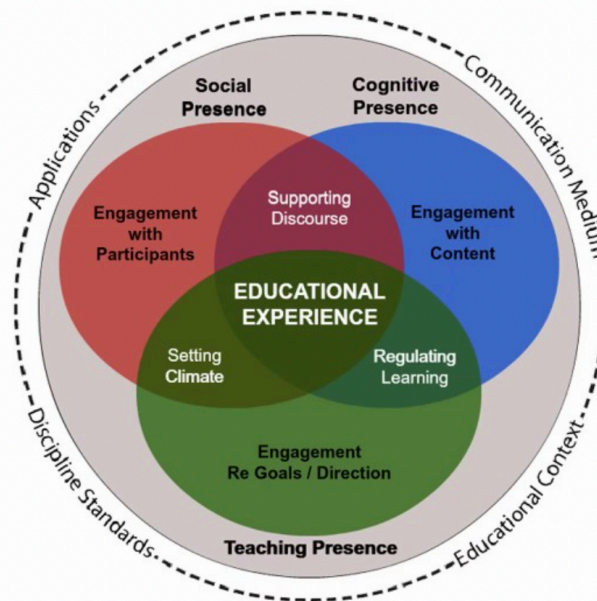
MOOCs as an online delivery form can be designed based on the premises found in the online Community of Inquiry theoretical framework (Cleveland-Innes, Parker, Ostashewski, & Wilton, 2016; Garrison, Anderson, & Archer, 2001). This inquiry-based MOOC, or iMOOC, (Cleveland-Innes, Ostasheski, & Wilton, 2017) includes three types of teaching presence to support learning. The first type is labeled 'instruction.' Here, there is no opportunity for student response but rather content is delivered in an adjusted lecture format. This instruction is offered in two ways. One is through short videos of someone presenting information supported by a visual of the person and slides/other visuals. The second way of offering instruction is in text-based presentation of material.

The second type of teaching presence offered in an iMOOC is labeled 'inspiration.' This learning support is offered by a person who plays the role of Inspirer, who, through text-based communication and short-videos, opens and closes each week of the course. This communication provides encouragement, direction, and inspiration at the start of each week and validation and closure at the end of each week. The third type of teaching presence is offered through roving facilitators who provide 'information' as needed. Four facilitators are available online to answer questions about technology, learning processes, and encourage students to respond to each other's questions, comments, and discussion forum posts.

## The Community of Inquiry Theoretical Framework

### 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.



### 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.

### Teaching Presence

The design, facilitation, and direction of cognitive and social processes for the purpose of realizing personally meaningful and educationally worthwhile learning outcomes.

Figure 1. Elements of an Educational Experience.

From Critical inquiry in text-based environment: Computer conferencing in higher education, by R. Garrison, T. Anderson & W. Archer (2000), *The Internet and Higher Education*, 2(2-3), p. 88.

Creating communities of inquiry in education delivery is a well-researched pedagogical approach. The original Garrison, Anderson, & Archer (2001) article explaining this framework has been cited in the scholarly literature over 4,600 times. Much of the early research focused on understanding social presence (Richardson & Swan, 2003; Richardson, Swan, Lowenthal, & Ice, 2016) as a new way to approach teaching beyond strict transmission models of delivery. A significant amount of research

has been done to measure the components of this framework and how they operate in reference to one another (Arbaugh, Cleveland-Innes, Diaz, Garrison, Ice, Richardson, & Swan, 2008; Garrison, Cleveland-Innes, & Fung, 2010). A recent analysis of literature published about online learning reports that “the most frequently used and the one adopted the most commonly in the literature is the CoI survey instrument developed by Arbaugh, et al. (2008)” (Olpak, Yagci, & Basarmak, 2016, p. 1090). Given this well-researched framework of online teaching and learning components, this model was used in the design and in the content for (TEL)MOOC.

In keeping with the three presences of the CoI model (social presence, cognitive presence, and teaching presence), the iMOOC design offered opportunities for self-reflection, active cognitive processing, interaction, and peer-teaching. In addition, our expert guidance on the need for shared application activities in teacher professional development shapes the important final assignment.

Course content is delivered through video with text scripts for participants. Knowledge-gains are tested through end-of-week, multiple-choice quizzes. Material usage is encouraged and reinforced by the course Inspirer and by teaching assistants acting as learning facilitators. A three-tiered model of instruction is featured in (TEL)MOOC, provided by the course instructor, the course Inspirer, and the roving learning facilitators. In addition, participants learn from one another in (TEL)MOOC through active discussions and sharing of activity plans. Additional resources are provided in (TEL)MOOC for participants wanting to learn more about a particular topic.

The transition to online teaching and learning in higher education occurs in tandem with a long overdue response to researching and addressing quality teaching in higher education. Building on work recently completed by the Institutional Management in Higher Education branch of the Organisation for Economic Co-operation and Development (OECD), this education experience will offer “a unique opportunity for learning through international experiences and sharing insights with institutional leaders involved in quality teaching” (Hénard, & Roseveard, 2012, forward) as the transition to online and blended delivery occurs. Increasing research, dialogue, and awareness of the importance of quality teaching through this opportunity, institutions will impact their own teaching development and that of other institutions. “In many institutions, quality teaching is a new, but rather vague and often controversial idea” (Hénard, 2010, p. 35) – as is the systematic support and promotion of quality, and the use of best practices, in teaching. Like the recent study of quality teaching at multiple OECD institutions, (TEL)MOOC is designed to bring people from many institutions together to collaborate and share quality teaching efforts.

Adding to this valuable professional learning opportunity, the participant network created in the (TEL)MOOC is designed to continue beyond a single course. A network, and the required infrastructure for such a network, will emerge out of this initial project. This will allow participant

focus on quality teaching for online and blended learning “in aeternum,” as long as it is needed. This network will also support the transition to online and blended delivery, as a key contributor to prepare teachers for competent engagement in virtual, digital societies. This preparation is no longer an option; online courses to teach how to teach online offer a significant opportunity.

Perhaps the most significant reason for creating this course and its possible ongoing network of teachers is the benefit to the students themselves. Among discerning consumers of education in an increasingly competitive, global market, quality teaching will become a distinguishing factor between institutions. In the ideal, quality teaching should be a necessary condition in all institutions. This quality must include the opportunity for students to develop competence for operating in a virtual, digital world. At some point in the not-too-distant future, operating in this virtual, digital world while learning will be an expectation. In fact, students are already increasingly technologically sophisticated; while not yet practiced in all ways of being online, they are becoming more prepared to integrate technology into learning (Bichsel, 2013; Johnson, Smith, Willis, Levine & Haywood, 2011; Tapscott, 2008). At the same time, convenience and flexibility will be assumed. Flexibility occurs when institutions engage more creatively in teaching and learning that varies over time and space, instructional pace, and delivery method (Fisher, 2009). Teaching and learning in collaborative communities connected not only by face-to-face engagement but virtual presence of many forms will become the new normal (Bolinger & Inan, 2012; Wenger, 2004).

## **Methodology**

There were 1143 registrants for (TEL)MOOC with highest enrolment numbers from India, Canada, Antigua and Barbuda, Lithuania, and Nigeria, followed by Bangladesh, Pakistan, Sri Lanka, Grenada, Rwanda, Lesotho and Tanzania. The registrants included teachers with experience from early education and elementary levels to secondary or high-school levels and vocational, college and university levels. There were 2267 discussion posts in total, including 1993 posts by 256 student participants. The majority of the participants of the (TEL)MOOC were recruited via the Commonwealth of Learning through their vast networking system. Announcements of the (TEL)MOOC were also listed on the OpenEdUp website through Athabasca University.

The first week of the (TEL)MOOC was titled *Models of Technology-Enabled Learning*, with the opening topic focused on the Community of Inquiry framework. After providing suggested readings, participants were asked to provide some insight into the benefits and challenges of using the CoI in technology-enabled learning. This study focuses on responses from 47 learners from higher educational institutions who participated in the first week discussion session by answering the following two questions:

1. What do you see as beneficial about the CoI as a way to understand technology-enabled learning for your students?
2. What possible challenges do you see?

Of these 47 participants, most were from Canada, Kenya, Lithuania and Nigeria, and most ranged between 30 and 54 years of age. Additionally, the majority of these participants hold a Master's or PhD degree or equivalent with 6-15 years' experience. This convenience sample of participants provided 56 responses posted to the discussion forum.

A transcript of all responses was prepared for further study and uploaded into ATLAS.ti, a computer software program used for qualitative data analysis. The original data structure from question responses, individually categorized as 'benefits' or 'challenges,' was maintained. Within each category, data analysis followed grounded theory methodology. Data were coded by two research assistants using open coding, "the interpretive process by which data are broken down analytically" (Corbin & Strauss, 1990). Next, the axial coding phase was conducted, where core themes were created and then reviewed to discern relationships to each other. A second pass of coding was then applied once the codes were selected and agreed upon. As Corbin & Strauss (1990) indicate, selective coding is the process by which all categories are unified around a "core" category, and categories that need further explication are filled in with descriptive detail. To ensure content validity, intercoder reliability was calculated using negotiated agreement versus raw agreement. Of the 213 coded texts, 153 were agreed upon, resulting in 72% agreement without negotiation. After negotiated agreement, the intercoder reliability score rose to 100%.

This applied approach was implemented for this collaborative project, so responses to the benefits and/or challenges of using the CoI as a framework could be gathered from teachers who are interested in technology-enabled learning and open education resources and who had just engaged in a (TEL)MOOC experience offering knowledge and practice of the CoI in teaching and learning with technology.

## **Findings**

The participants of the (TEL)MOOC were asked to respond to the following questions and to post their answer on the (TEL)MOOC discussion forum - *What do you see as beneficial about the CoI as a way to understand technology-enabled learning for your students? What possible challenges do you see?* Using qualitative analysis based on grounded theory, we conducted a thematic analysis of the 56 unique and individual posts. This included open coding by two research assistants to identify themes, axial coding to confirm the concepts and categories, in addition to exploring how the concepts and categories were related. Themes were identified within the two original categories of benefits and

challenges, as indicated in Table 1. Thorough coding of the transcripts yielded a greater number of references to CoI benefits (56%) versus references to CoI challenges (44%).

**Table 1: Benefits and Challenges of CoI to Understanding Technology-Enabled Learning**

Challenges	Benefits
Lack of Technical Infrastructure	Collaboration
Design	Increased Accessibility/Flexibility
Cyber Malice	Increased Interaction
Lack of Skill Set/Support and Training	Enhanced Learning
Lack of Student Motivation/Participation	Social Presence
Buy-in (student)	Student Engagement
Buy-in (faculty)	Open Communication
Buy-in (administration)	Group Cohesion
	Motivation

## Benefits

The largest theme found in the participant responses to benefits is that of collaboration. Respondents found that the CoI framework brought their students together to “appreciate the value of learning together and help them improve connections and collaboration for a meaningful learning experience”. Another participant stated that “CoI provides the three-dimensional view for interaction of collaborative teaching and learning environment. This will enable effective learning to the students”.

The second largest benefit cited in the responses refers to the increase of accessibility and flexibility through CoI Teaching Presence and allowing deep learning to occur without the barriers of time and location. One participant wrote:

... integrating technology in this matter will greatly enhance these connections and broaden the students’ knowledge access as they not only rely on the material available from school or recommended by the teacher but a much wider database of textbooks, journals, articles, simplified diagrams and video presentations. Technology will also allow the ease of tailoring the method of delivery to the students as some can access e-books and others can access video presentations for example.



The third and fourth factors that emerged in analysis as being beneficial in incorporating CoI is the increase of interaction and the enhancement of learning. Participants felt that by incorporating CoI with technology-enabled learning amplified interactions not only from student to student, but student to teacher and student to content. Others mentioned that it gave students a voice to participate and gave confidence to those who would otherwise be too shy to interact and communicate with their peers in a traditional learning environment, stating, for example, “Postings that are asynchronous and part of the course facilitate the participation of all learners in the course. There is less chance than in a large face to face class of remaining passive” and “The CoI can serve as a learning platform where student and teachers can interact effectively. CoI gives students who are shy in a face-to face classroom the opportunity to ask relevant questions which otherwise would not have been asked in a face-to-face class”.

Enhanced learning can be viewed as taking student learning to a higher and more meaningful level of learning. Participants stated that it added elements of active learning, promoted deep learning, self-directed learning, reflective learning, metacognition, developed critical thinking and enhanced creativity and problem solving.

The fifth benefit identified by the participants is social presence, described as the ability of learners to project themselves socially and affectively into a community of inquiry. One participant wrote “CoI will enable my students to appreciate the value of learning together and help them improve connections and collaboration for a meaningful learning experience”. Another stated “With distance learning it is technology that enables these three presences to form a community where we socially interact, learn, and receive instruction. CoI has the potential to create a strong social learning experience improving connection, communication, and collaboration between students and instructors without barriers and or limits of distance”.

The sixth most cited benefit by the participants is student engagement, defined as the degree of attention, curiosity, interest, optimism, and passion that students show when they are learning. Most of the comments on increased engagement relate to building a community of learning and providing a supportive and impactful learning experience, as evidenced by the following statement: “CoI might be an engaging activity for students and this approach could contribute to the dialogue between students thus creating the sense of belonging to a community”.

The seventh most commonly mentioned benefit relates to how open communication, the ability to create an environment of trust and openness for students to communicate and express themselves, provides greater opportunities for students to share their ideas, thoughts and experience in a safe and risk-free environment, thereby “creating a strong social learning experience improving connection, communication, and collaboration between students and instructors without barriers and or limits of distance”.

Minor mentions of the benefits of group cohesion and motivation were also noted in the discussion posts. A summary of benefit codes, definitions, frequencies and examples is given in Table 2.

**Table 2: Summary of Findings-Benefits**

<b>Code</b>	<b>Definition</b>	<b>Frequency</b>	<b>Quote Example</b>
<b>Benefit-Collaboration</b>	A practice of individuals working together in an intellectual endeavor.	23	<i>I believe that COI definitely enhances the opportunities for collaboration among learners - providing synchronous as well as asynchronous communication capabilities for engagement and supportive/collective impact between learners.</i>
<b>Benefit-Increased Accessibility/Flexibility</b>	Technology enabled learning allows for learning anytime and where, letting students learn without the barriers of time and location.	21	<i>One major benefit of COI is the flexibility. COI has the potential to create a strong social learning experience improving connection, communication, and collaboration between students and instructors without barriers and or limits of distance</i>
<b>Benefit-Increased Interaction</b>	A platform to facilitate an increase of student to student and student to teacher interactions.	16	<i>The COI can serve as a learning platform where student and teachers can interact effectively. COI gives students who are shy in a face-to face classroom the opportunity to ask relevant questions which otherwise would not have been asked in a face-to-face class.</i>
<b>Benefit-Enhanced Learning</b>	Taking student learning to a higher and more meaningful level of learning.	14	<i>I also believe that this activity promotes self-directed learning and is an active learning activity that would benefit learners especially in a nursing program, as these self-directed and information seeking skills are imperative in the nursing profession.</i>
<b>Benefit-Social Presence</b>	The ability of learners to project themselves socially and affectively into a community of inquiry.	12	<i>Benefits of COI for my students COI will enable my students to appreciate the value of learning together and help them improve connections and collaboration for a meaningful learning experience.</i>
<b>Benefit-Student Engagement</b>	The degree of attention, curiosity, interest, optimism, and passion that students show when they are learning.	9	<i>COI is reasonably a clear departure from the old style of teaching and learning. it is evidently engaging and learning friendly and allows the learners use their capabilities to create and recreate the learning environment.</i>
<b>Benefit-Open Communication</b>	To create an environment of trust and openness for students to communicate and express themselves.	6	<i>What I like about this model is that it shows the benefits of working to facilitate a community in which members feel safe to contribute what they know</i>
<b>Benefit-Group Cohesion</b>	When a bond arises from a group of students working together resulting in a gratifying learning environment.	2	<i>It fosters personal sharing, participation and trust in connection with classmates and facilitators</i>
<b>Benefit-motivation</b>	The increase in the desire to learn and to persist in a course/program.	1	<i>It increases student's motivation and accelerate learning</i>

## Challenges

The most common challenge identified throughout the participant responses is the lack of technical infrastructure to facilitate technology-enabled learning. This overarching concern usurped focus on the CoI as a framework in this instance. Many cited issues of limited bandwidth, unreliable Internet connections and a lack of available resources such as laptops, tablets, cell phones and computers. One participant wrote “The challenges are numerous. One, poor network especially in many sub Saharan countries. Two, the cost of internet is still high in many developing countries. Third is choosing the appropriate media to use to facilitate learning”.

The second largest challenge described by the participants is designing courses with the pedagogic principals of CoI and integrating technology in a way that supports meaningful learning. Some felt that it would be too time consuming to develop new learning activities, projects and assignments, in addition to choosing the proper media. One participant stated: “It can also be difficult to come up with the material, technology and experience to ensure that the CoI is embedded in the learning throughout the course/curriculum”.

Others mentioned issues of designing courses with the proper pedagogical principals as the third biggest challenge to the CoI as a way to support technology-enabled learning. As articulated by one of the participants “CoI challenges the design and implementation of courses to be enabled by technology in such a manner as to retain the learner's basic fascination with technology while moving on to deep learning”.

The theme of cyber-malice as a challenge is also prevalent in the participant’s responses. Cyber-malice included comments about students engaging in unethical practices and academic dishonesty. Cyber bullying was cited as the main concern, followed by concerns of cheating and other forms of academic dishonesty.

Lack of skill set/support and training was listed as the fourth most-cited challenge by the participants. Comments included descriptions of instructors and/or students lacking the training, support or skill set to teach and or learn with technology. As many of the participants come from developing countries, they felt that the teachers and students lacked resources and the training to adequately incorporate technology enabled learning. One participant summed this up by revealing:

At the higher education level, many students are still not familiar with the use of computer and other technological devices and may not be able to participate fully in group activities. Indeed, the disparity in knowledge and skills in this regard may hinder group interaction and impede cohesion among team members. To create a good teaching presence, teachers need to acquaint themselves with the various social media technologies and also develop competence in using them for pedagogical purposes. The challenge may arise in the need to constantly upgrade or update their knowledge of these technologies in order to play their roles more effectively. Unfortunately, given the vastness of existing tools and the speed at which the technologies are changing, it may be very hard for teachers to keep with this task and the growth of the social media world.

The fifth most-cited challenge by the participants is the lack of student motivation/ participation or the lack of desire to learn and to persist or participate in a course/ program. Many showed concern for students not fully engaging with the content and/or their instructor and peers. One participant encapsulated this sentiment by stating,

For an authentic CoI to develop, it takes commitment from all members of the community. Some students see online learning as a way to learn independently, but the COI is about learning collaboratively. If students do not engage with one another, or do not trust the instructor sufficiently to imitative interactions when they run into challenges, the CoI will fail to develop to its full potential. To a lesser extent, but worth mentioning, is the challenge of student, instructor and institutional buy-in (getting students, faculty, and administration on board with online learning) described in the discussion posts. A summary of challenges codes, definitions, frequencies and examples can be found in Table 3.

**Table 3: Summary of Findings-Challenges**

Code	Definition	Frequency	Quote Example
<b>Challenge-Lack of Technical Infrastructure</b>	Challenges with technology – such as limited bandwidth, unreliable Internet connectivity and/or lack of available resources such as laptops	24	<i>The challenges are numerous. One, poor network especially in many sub Saharan countries. Two, the cost of internet is still high in many developing countries. Third is choosing the appropriate media to use to facilitate learning.</i>
<b>Challenge-Design</b>	Challenge of designing courses with the pedagogic principals of COI and integrating technology in a way that supports meaningful learning.	17	<i>COI Challenges The design and implementation of courses to be enabled by technology in such a manner as to retain the learner's basic fascination with technology while moving on to deep learning.</i>
<b>Challenge-Cyber Malice</b>	Students engaging in unethical practices and academic dishonesty.	13	<i>The possible challenges are the same as in social media, Internet: aggression, cyber bullying, disrespect. Cybercrimes Impersonation</i>
<b>Challenge-Lack of skill Set/support and Training</b>	Instructors and/or students lack the training, support or skill set to teach/learn with technology.	11	<i>A few of the disadvantages that can exist in regards to COI is ease of use and if institutions do not support the training of facilitators to implement these resources in their classrooms.</i>
<b>Challenge-Lack of Student Motivation/participation</b>	The lack of desire to learn and to persist or participate in a course/program.	10	<i>The challenges would be to ensure that all students are actively engaged in the process and contributing.</i>
<b>Challenge-Buy-in (student)</b>	Challenges of getting students on board with online learning.	3	<i>Expectations of a learning environment may frustrate learners who are used to the tradition of expert lecturer model and/or unsure about social media applications.</i>
<b>Challenge-Buy-in (faculty)</b>	Challenges of getting faculty and colleagues on board with online learning.	3	<i>There are many obstacles which should be taken care of. 1.) Bad attitude of teacher; who doesn't want to accept the changing methods of education</i>

<b>Challenge-Buy-in (admin/institutional)</b>	Challenges of getting administration and institutions on board with online learning.	2	<i>Possible challenges lie in trust and substantive collaboration in establishing a vision and developing strategic action plans</i>
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## Discussion

In this study, participants studied the Community of Inquiry (CoI) theoretical framework while participating in one themselves. Many noted that incorporating CoI with technology-enabled learning amplified interactions not only from student to student, but student to teacher and student to content. Not only did students feel more confident to share their voice in this type of learning environment, they found they were less shy about interacting and communicating with their peers. Many participants also appreciated the social aspect of this learning environment. They found that it added elements of active learning, promoted deep learning, self-directed learning, reflective learning, metacognition, developed critical thinking and enhanced creativity and problem solving with their students. Xin (2012) corroborates the importance of these advantages in her evaluation of the CoI framework, and writes that “online expression, like its face-to-face counterpart is multi-functional, [and] because of the multi-functionality of communication the three main aspects of the CoI – cognitive presence, social presence and teaching presence are intertwined” (para. 52).

Following completion of the (TEL)MOOC, participants cited additional benefits in a post-course survey, re-emphasizing the value of social presence, student engagement, openness and trust. Similar accounts were described by Stodel, Thompson, and MacDonald (2006): “There was a sense of caring and learners indicated that people were usually quick to help, share resources and information and respond to questions” (p. 9). Finally, Lambert and Fisher (2013) provide “further support for the use of the CoI framework and its three essential elements (i.e., teaching, social, and cognitive) as a guide for designing an online course, particularly a course in a soft, applied discipline such as educational technology where learning the use of technology is as important as gaining conceptual knowledge” (p. 12).

While participants expressed numerous benefits about the Community of Inquiry as a way to understand technology-enabled learning for their students, they did also cite possible challenges. Notable is the emphasis in the challenge category related to the use of technology, rather than the CoI framework itself. Their greatest concern included the lack of technical infrastructure to facilitate technology-enabled learning. Many educators experience limited bandwidth, unreliable Internet connections and a lack of available resources such as laptops, tablets, cell phones and computers. Koh and Hill (2009) also found that technological challenges (e.g., slow connection speeds, lost connectivity) may also deter communication between group members, making collaboration difficult.

When communication is constrained by the technical apparatus, the collaborative process cannot function at an optimal level. Until time and funds resolve these issues, some educators will be unable to implement CoI supported technology-enabled learning.

Other participants are concerned that integrating CoI with technology-enabled learning may not support meaningful learning, or that designing courses with the proper pedagogical principles would be an issue. Stodel et al. (2006) identified this concern in earlier research. They found “that learners can be successful in online courses in terms of learning outcomes, yet still long for a richer experience” (p. 19). Their study also illustrated “the need to understand learners in order to help them develop coping and adaptation strategies so that the online learning experience is effective and enjoyable” (Stodel et al., 2006, p. 19), and that “further research is needed to better understand how technology can be used more effectively (and innovatively) to open up tangents that may lead to more cognitive presence and movement through the critical thinking process as outlined in the community of inquiry framework” (p. 11).

Beyond the necessity of access, these findings also re-emphasize the need for efficient and effective teacher professional learning for technology-enabled learning and conceptual frameworks such as the CoI. It is not uncommon for educators to fear a lack of skill set or support and training or a lack of student motivation or participation when it comes to technology enabled learning. However, “a well mapped out course seems to increase learners' competence and confidence” (Stodel et al., 2006, p. 11). While adding technology skills to course requirements may have increased anxiety, particularly in students with less technology ability, growth in this area tends to show that students became more comfortable and felt more capable of handling this additional mental load (Lambert & Fisher, 2013). Therefore, further research, education and training can only help to resolve these educator and learner apprehensions alike. Finally, Lambert and Fisher (2013) support the fact that more research is needed to “examine the effect of technical skill proficiency on students' ability to focus on the course content, to collaborate and communicate, and develop a sense of community in online learning environments, particularly when a wide variety of newer tools is used in this effort such as in educational technology courses” (p. 12).

## **Implications**

Suggestions about the application of the CoI model for practicing teachers and areas of further research are evident in this study. Respondents note the support for collaboration and flexibility available in the CoI theoretical framework. These notions are well-supported in the research about the use of the CoI (Rockinson-Szapkiw, Wendt, Whighting, & Nisbet, 2016; Stenbom, 2018); Even in this sample of early users, there is further evidence that those who implement the CoI as a design for online and blended learning will be able to engage in collaborative and flexible teaching and learning.

The participating teachers in (TEL)MOOC experienced a community of inquiry as a learning environment; these teachers now have a view of what it is like to be an online learner in a Community of Inquiry. This experiential learning opportunity provides a point of reference when designing for or engaging student learning in online environments. As blended teaching and learning is now rising in application and popularity (Bernard, Borokhovski, Schmid, Tamim, 2014) this online experience may also assist when and if these teachers engage in blended learning design; the community of inquiry is equally beneficial in combined in-person and online learning delivery (Vaughan, Cleveland-Innes, & Garrison, 2013).

In addition to this experiential opportunity to participate in and study the CoI, these participants also engaged in a critical analysis of the theoretical framework, at least in reference to their own practice. Their interpretations are the results of this study. Further research into sustainability or change of these initial views is warranted.

### **Limitations**

There are two limitations in this qualitative study sample that should be acknowledged. The first is that the sample is not representative of the broader higher education sector. The majority of the participants are from developing nations, thereby limiting the study's ability to represent and generalize for all those instructing in higher education. The second limitation was the use of a convenience sample, as participants volunteered for the study and were not purposely or strategically selected.

### **Conclusions**

This study investigated the benefits and challenges of the CoI framework utilized in technology-enabled higher education, as identified by iMOOC participants. It adds to our current knowledge base in several ways. First, even in 2018, educators from a wide range of geographic locations still note that technology access is a necessary, if insufficient, condition for successful online learning. The responses by the participants indicate that although they perceive potential challenges in the lack of technical infrastructure, the benefits of collaboration, increased accessibility, flexibility and interaction outweighed the difficulties. Second, MOOCs such as the (TEL)MOOC designed with CoI principles allowed participants to experience such an online environment. Within the first week of the MOOC, where study of the CoI framework was included, participants were able to evaluate the CoI framework for their own education context. Data from this evaluation are consistent with previous CoI research findings, suggesting this iMOOC opportunity provides a sound learning experience for participants. Through the constructivist-based e-learning design, many participants for the first time experienced social presence, cognitive presence and teaching presence during their learning, offering experiences of self-reflection, active cognitive processing, interaction and peer-teaching, which are all

significant aspects of CoI. This provided participants with an experiential learning opportunity with sound conceptual knowledge, the combination of which allows them to implement the CoI framework into their own practise of teaching.

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