Research Article

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Developing Learning Communities Online: A Multi-year Study Exploring the Role of Not-for-credit Online Activities to Support Student Connection

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Abstract

While online course delivery in higher education has been increasing for several decades, students can face unique challenges in the digital environment. At a small university in Western Canada, online and blended learning have been a major focus for course delivery since 1995. Considering the risk that students could experience a lack of meaningful connection with their fellow students, the university launched a not-for-credit online learning module in 2006 that was designed to provide new-to-program students with resources and activities to encourage learning community development. Since the first module was launched, several programs at the university have adapted the original module to suit their specific needs. In this paper, we explore the experiences of graduate students in three programs over an eight-year period. Students completed surveys focused on the role of three module activities in helping them develop a supportive online learning community. The findings were organized under three areas that revealed elements of the module that worked well, areas for improvement, and suggestions for module additions. The recommendations call for making modules that are not-for-credit, mandatory, support both synchronous and asynchronous collaboration, use only one web-based entry point, consider time zones, and support students' ability to balance their education with their out-of-school commitments. For those who may wish to include similar activities for their students, we have included a link in the paper to the Open Educational Resource that was developed in support of our research.

Keywords: online learning communities, learning community development, student collaboration, student relationship building

Introduction

Over the past several decades, online delivery in higher education has increased in popularity, in part due to the flexibility that it affords instructors and students, and the innovative ways that education can be delivered (Bates, 2021a; Bates, 2021b; Allan & Seaman, 2017). As educational institutions navigated the unexpected closures of their face-to-face operations amidst lockdowns and various government mandates throughout the peak of the COVID-19 pandemic, the adoption of online learning drastically accelerated (Jena, 2020). Though Royal Roads University (RRU) has championed online and blended learning, with an emphasis on asynchronous delivery, for over two decades, this rapid growth brought on by the pandemic in online education among higher education institutions drew further attention to the need to mitigate the transactional distance (Moore, 1997) and loneliness often felt in the online learning environment (Kaufmann & Vallade, 2020).

Due to RRU's expertise in online and blended learning, instructors are familiar with the challenges experienced by both learners and educators in the online environment, and they constantly work to improve this experience for all involved (Axe et al., 2020). One method used is a foundational online learning community development module (OLCDM), designed not only to give students an understanding of the tools and services that the university has to offer, but also to provide an opportunity to develop strong connections among learners working in cohorts at the beginning of their academic journeys.

Learning Community Development Module

In consideration of student experience in face-to-face, blended, and online learning environments, RRU's first OLCDM, the Bridge to BCom, was introduced in 2006 (Axe, 2009). A primary consideration in the development of this module was to address challenges faced by students forming learning communities and building sustainable connections with their peers. The pilot version of the 2006 OLCDM was created to address the identified student need, and was in alignment with RRU's Learning and Teaching Model, which was formalized later (Royal Roads University, 2013). In 2014, the Link, an updated version of the original OLCDM, was included as mandatory non-credit module at the start of the Master of Arts in Learning and Technology (MALAT) and the Graduate Certificate in Instructional Design (GCID) programs at RRU. The Master of Arts in Interdisciplinary Studies (MAIS) incorporated its own version of the OLCDM in 2021, named MAISCON. As the activities discussed in this paper are common to the Link and MAISCON, we will refer to them both as the OLCDM.

In its present form, the OLCDM features a blend of asynchronous instructional material, such as readings from journals, pre-recorded video and audio presentations, and participation facilitated through discussion forums, as well as synchronous video conferencing. In the OLCDM, students are required to complete activities designed to emphasize three key tenants:

1. online learning community building,
2. program and university orientation, and
3. learning support availability.

The first tenant refers to the development of positive online learning communities within student cohorts. In the OLCDM, there is a blend of individual and team activities, with formalized team

coaching offered throughout the duration of the module. There are numerous tools and instructional strategies incorporated in the module that are designed to facilitate communication and collaboration. The second tenant orients students in the university and their programs by highlighting the university's unique vision, its learning, teaching, and research model, and its collaborative focus. The third tenant allows OLCDM participants to gain an understanding of the learning support services such as the library and writing centre, and what to expect with the learning experience.

Literature

A review of existing literature examining the formation of online learning communities explored the following areas: origins of online learning communities, building learning communities, sustaining and supporting learning communities, and types of online communities. The literature is discussed below in the context of each of these areas.

The Origins of Online Learning Communities

In the early days of online learning in higher education, circa 1990, community-building in the digital environment was not a primary consideration for institutions offering online learning programs. Many faculty did not think that it would be possible to reach similar levels of connection and community amongst online learners as with their face-to-face counterparts. Taylor (2001) identified five generations of distance education/online learning and noted that each is distinguished by the amount of learner choice in terms of time, place, and pace of study. Tools allowing synchronous discussion, especially over video, were not initially universally available, and interaction among learners was not actively encouraged or facilitated by many higher education institutions. In recent years, learners in the online environment remain less likely than students in the face-to-face classroom to engage in collaborative learning or interact with faculty, as found by Dumford and Miller (2018) in their study of over 300,000 bachelor-level students across 541 institutions in the United States.

As the benefits of online learning became more widely understood and technologies advanced, its adoption by academic institutions grew. Online learning became not only a supplemental offering by higher education institutions, but also core part of the business model of many of those institutions (Benson & Brack, 2010), as well as a way to meet growing student demand for personalization of their learning experience. As Coomey and Stephenson (2001) concluded, "online learning appears to facilitate a migration from traditional didactic modes to more learner-managed learning modes if teachers and designers wish to take such a journey" (p. 49). Institutions increased the resources allocated to online learning, resources which consisted not only of the funds available to purchase more advanced tools and develop enhanced platforms, but also included encouraging research in online environments, as well as the detailed collection of student feedback. Several institutions began to include online learning as a key component of their strategic direction, and faculty were asked to consider how this might inform or change their teaching philosophy (Kanuka, 2008). One of the promising practices that emerged from the 1995 to 2006 timeframe was the value of developing online learning communities (Lock, 2007).

Building Learning Communities

To effectively build online communities, engagement across all stakeholder groups is critical (Covelli, 2017); however, one of the most important factors is the cultivation of an environment

in which students can engage in peer-to-peer learning and support (Kaufmann & Vallade, 2020). The cohort learning model was found to be an effective foundation for such an environment, as it allowed students to create relationships based on shared experiences in their programs, while the extended time together allowed the relationships to deepen (Berry, 2019; Lively et al., 2021). Key components that enabled students to connect with each other were the platforms and tools that allowed them to communicate easily and naturally (Rockinson-Szapkiw & Wendt, 2015). Schwier (2001) highlighted communication as the foundational component of successful community building in the virtual environment. The products of communication in this context as a catalyst for community are interaction, engagement, and alignment, aspects which are critical in building a strong community (Schwier, 2001).

To help build inter-cohort connections, many institutions offered a blended learning option, where a face-to-face on-campus period was offered early in an online program. This blended model of delivery has been found to facilitate the establishment of relationships between students early on, with students being able to collaborate to a greater degree and share in learning more effectively after the face-to-face portion had ended and the online component of their program began (Fields et al., 2016). However, when the option of face-to-face learning environments was removed due to lockdowns and global travel bans, migrating to fully online learning during the COVID-19 pandemic posed numerous challenges. One of the primary obstacles of moving online was the difficulty that many students faced in establishing social connections in the digital environment (Lemay et al., 2021). Researchers who had been involved in online and distributed learning before the pandemic were quick to point out that the online delivery forced on students and instructors during the pandemic lockdowns was not, and should not, be considered online learning. Bates (2021a) and Hodges et al. (2020) referred to the higher education online pandemic response as *remote emergency teaching*. The implementation of remote emergency teaching may be characterized by a lack of carefully thought out and researched processes, and the absence of adequate support from the key departments of the institution (van Oostveen et al., 2021).

Whether as a result of the pandemic, or due to other external drivers, the challenges associated with the implementation of online learning are not new. Physical distance (Moore, 1997), isolation (Koole, 2014; McInnerney & Roberts, 2004), the lack of peer-to-peer and peer-to-instructor interaction (Dron & Anderson, 2014), and poorly designed online learning experiences that approach online learning as a digital version of textbooks (Childs & Chrichton, 2018) are some examples of these challenges. As Morris and Stommel (2013) commented, “...online learning programs fail because [course designers have] been told, and they believe, they must operate within the same paradigm of learning and teaching that on-ground programs obey. This is a falsehood, a misconception, and at times a deception” (para. 5).

Developing appropriate tools and practices to help online students overcome the challenges highlighted above became more critical than ever. Initially, tools designed to deepen engagement and improve communication ranged between those designed for more informal, optional collaboration such as learning cafes or open blogs, and those made to support structured, mandatory program components such as synchronous video conferencing (Adams & Wilson, 2020; Cleveland-Innes & Gauvreau, 2011; Delmas, 2017; Dolan et al., 2017). These tools then expanded to include social media, virtual reality, and augmented reality (Geroimenko, 2020). While acknowledging the importance of tools in the online learning environment, Dixon et

al. (2006), emphasize that technological tools alone cannot be credited with the development of a learning community. The researchers found that "collaborative and supportive environments must be developed through enhanced instructional design and facilitation skills" (Dixon et al., 2006, p. 2).

Sustaining and Supporting Learning Communities

Currently, higher education institutions are continuing to dedicate resources to improve the online learning environment; central to many of these efforts is the addition of online tools designed to increase collaboration, communication, and engagement. One critical component of advancements in this area is to ensure that there are tools to facilitate synchronous discussion among students. Synchronous discussions were found to increase the sense of community by making students' peers feel real and authentic, promoting spontaneous discussion, allowing students to share experiences and learning, and enabling them to deepen their trust in one another (Cornell et al., 2019; van Oostveen et al., 2016). Additionally, Reedy (2019) found that face-to-face discussion may help marginalized students build relationships in the online environment, and strengthen their sense of community and belonging. Furthermore, the relationships that were strengthened through synchronous discussion enabled students during the pandemic to support each other through challenging times. As these discussions increased the sense of connectedness between students, the connections helped sustain students and reduced the perceptions of loneliness and isolation in the online environment (Kaufmann & Vallade, 2020).

As we strive to understand the balance required to create both a fruitful learning experience and assist students as they work to develop connections with their peers, researchers have studied how various combinations of communication methods have different levels of impact. Studies have found that there is no universal combination that works across universities, programs, or even within the same cohort (Fields et al., 2016). The preferred type of communication and the degree to which certain types are used over others, varied greatly among student groups, and even among the same cohort of students at different points in their program (Fields et al., 2016). McInnerny and Roberts (2004) reported that a balance between synchronous and asynchronous communication increases the quality of the learning environment as the asynchronous method of delivery increases the flexibility and accessibility of information, while synchronous communication allows a sense of social presence to develop, leading to a stronger community. Fields et al. (2016) found that, while the EdD students in their study appreciated the structured discussion forums at the beginning of their programs, as they progressed in their studies the use of the forums decreased and the students navigated towards peer learning communities, which were characterized as student-created, and provided more fluid ways for students to support and communicate with each other.

Types of Online Learning Communities

There are various types of online learning communities, each with unique strengths. Berry (2019) noted that, as the students in their study progressed past regular coursework and began self-directed work on their theses, the flexible student-created community was favoured because it allowed learners to contribute at their own pace and in the way that fit them best. In contrast, although the online platform covered in Cleveland-Innes and Gauvreau's (2011) research was created and directed by the institution, it incorporated ways for students and instructors to engage in an unstructured way, in addition to serving as a formal location to

procure information and advice. The portal created for Bachelor of Arts students at the University of New England in Australia was similar to the platform in many ways, although the Australian portal was substantially scaled up, as it was designed to serve approximately two thousand students at any given point in time (Nye, 2015). Thomas and Fatherly (2017) and Watts (2019) discussed orientation-style types of communities. In their research, the institutions they studied had developed units with the goal of conveying crucial information, creating community, and aiding students in their transitions into the programs. Thomas and Fatherly (2017) noted that the subject of their study, a course called the "Roadmap Seminar" found success by integrating a structured assignment in which students had pre-determined material to study and discuss, and a second assignment where the topic could be determined by the student. Incorporating both items allowed students to build connections through the shared experience provided by the first assignment, while the second self-directed assignment allowed them to learn more about each other and what they valued. Watts (2019) found that the program-specific timing restrictions were an issue because there were multiple intakes throughout the year, but the module was only offered once annually. Students whose program start date did not coincide with the module noted they would have benefitted more had the timing been aligned.

Methodology

To increase our understanding of the effectiveness of the OLCDM in its ability to successfully create and sustain online learning communities while expanding our understanding of the roles of students, faculty, and administrative support, we used an action research approach (Clark et al., 2020). The collaborative component the approach was modified because participants changed year over year, and therefore did not participate throughout all iterations of the research. Using data collected over an eight-year timeframe, between 2014 and 2021, we considered students' experiences and perspectives in determining what had made the OLCDM successful, what was ineffective, and what could be included in the module for future offerings. In total, 134 responses were received.

Participants

As discussed, participants in the OLCDM came from three programs at Royal Roads University:

1. MALAT,
2. GCID, and
3. MAIS.

Participants were in most cases part of learning cohorts, which in the RRU context is characterized as groups of students on the same learning path, which enables the building of greater levels of trust between students (Royal Roads, 2023).

Participants in the MAIS OLCDM were typically working professionals aged between mid-twenties and mid-sixties, with professional backgrounds ranging from engineering to government, to hospitality, to education, to real estate. While in each program most students were typically from Canada, participants also came from throughout the world, living in countries including the United States, Mexico, China, New Zealand, and the United Arab Emirates. The MAIS program typically catered towards working professionals in senior supervisory or

management roles. There were two pathways to admission: (a) Standard admission; and (b) Flexible admission. In the first pathway, students entered with a B+ average in an undergraduate degree; in the second pathway, applicants' work experience could be considered in lieu of academic credentials. In MAIS, many students entered using the flexible route, resulting in students who were mid-career professionals.

The MALAT program is designed to address the need for qualified professionals in the field of technology-mediated learning and education, and the need for management-level individuals who have the knowledge, skills, and ability to assume the leadership roles that are required to plan, design, develop, implement, and evaluate contemporary learning environments (Royal Roads University, 2022a).

The GCID program is designed to build the knowledge and practical skills of professionals working in the field of technology-mediated education and meets the growing need for management-level individuals, who have the knowledge and skills to assume leadership roles in program design, development, and evaluation, as well as the need for effective facilitators in digital learning environments (Royal Roads University, 2022b).

Data Collection

At the end of their participation in the OLCDM, students were asked to complete a questionnaire consisting of both Likert scale and long answer questions regarding the various components of the OLCDM. The response choices for the Likert scale questions were *did not meet expectations*, *somewhat met expectations*, *neutral*, *met expectations*, and *exceeded expectations*.

Data Analysis

Responses to the questionnaire were analyzed using (a) Excel for the Likert scale responses; and (b) NVivo to code the qualitative responses.

Quantitative Responses

The purpose of the quantitative, or Likert scale, questions was to determine the impact of the various components of the OLCDM orientation module. Students were asked to indicate how three OLCDM activities aided the initial development of a supportive learning community. The activities were:

1. Creating an Online Presence,
2. Creating an Annotated Bibliography, and
3. Building Your Community.

Responses to the Likert scale questions were compiled in an Excel document, and we assigned points ranging from zero to four attributed to each response, with zero points awarded to any *did not meet expectations* responses, and four to *exceeded expectations*. After assigning points, we calculated the average score for each question.

Qualitative Responses

The qualitative responses were organized into two main areas: *Orientation Experience* and *Supportive Online Learning Community* (SOLC), and themes were developed under each area. The Orientation Experience will not be discussed in this paper and will be the subject of a later publication. Within the broad SOLC area, the anticipated themes (Ayress, 2012) were: (a) What Worked Well, (b) What Could be Improved, and (c) What Could be Added to highlight aspects that students enjoyed, aspects that they deemed to be detrimental, and suggestions that the students had for improvement of the OLCDM. Within these anticipated themes, sub-themes emerged and will be discussed later in this paper.

Limitations

Three primary limitations exist regarding the survey method of data collection:

1. there was only one data set from MAIS students,
2. survey participants left out questions and/or provided the same answer to multiple questions, and
3. the optional nature of the questionnaire. These limitations resulted in only select students taking part, and therefore the data does not capture all opinions.

As the survey was not a mandatory component of the OLCDM, respondents of the questionnaire tended to be students who had very strong opinions of the OLCDM or some of its components, and/or students who were highly engaged. Therefore, the experiences of students who may not have found the OLCDM an impactful or engaging start to their programs were not seen, as they did not take the time to communicate their opinions. Consequently, there was a missed opportunity to gain understanding of how to maximize the OLCDM's effect over a broader range of students.

Findings – Supportive Online Learning Community

Quantitative Data

The following table and graph show a quantitative representation of students' experiences with the three OLCDM activities that were focused on the development of a supportive online learning community. Table 1 shows that most of the activities received scores of met expectations or exceeded expectations, with the Creating Online Presence activity being the most highly favoured of the three.

Table 1

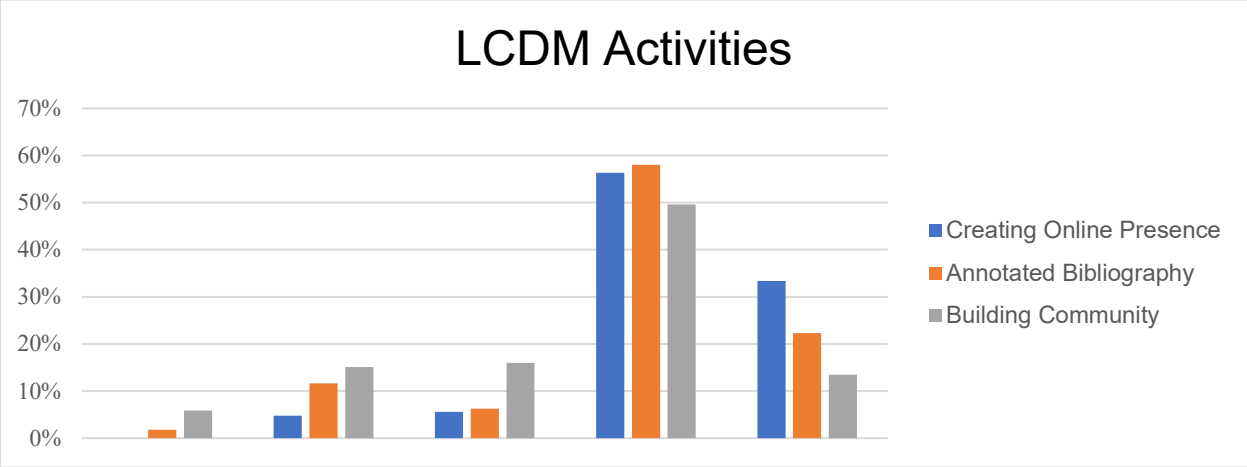
OLCDM Activities

Activity	Did not meet expectations	Somewhat met expectations	Neutral	Met expectations	Exceeded expectations	Average Score
Creating Online Presence	0%	5%	6%	56%	33%	3.18
Annotated Bibliography	2%	12%	6%	58%	22%	2.88

Building Community	6%	15%	16%	50%	13%	2.50

Figure 1

OLCDM Activities



Two of the three activities were individual, and one, Creating an Annotated Bibliography, was a team-based assignment. The Creating Online Presence was the most well-received exercise, and the Building Community activity the least. Commentary from the students indicated that they did not have an overall preference as to team activities or individual ones; instead, how the activity was presented, the required tasks incorporated in the exercise, and the tools that students were provided with were the most substantial factors.

Qualitative Data

Three anticipated themes from the qualitative data will be discussed below:

1. What Worked Well,
2. What Could be Improved, and
3. What Could be Added.

Within each of these anticipated themes, sub-themes emerged from the data.

What Worked Well

Getting to know others. The most commonly occurring theme in the data was that students appreciated the OLCDM role in facilitating their getting to know others and aiding in the building of their learning communities. One student remarked that “it really helped me to get to know my cohort, I feel this is really important” (LINK 16-17). This sentiment was echoed by other students, and one of whom stated “the Link allowed for the interaction amongst my cohort right from the start. It was easy to navigate and get involved in the discussion” (LINK 16-17) and another “it helped in getting us introduced to one another, beginning to build relationships so

that day 1 of class felt a bit familiar already" (MAISCON 21). Also, one student found that "the program does a great job of encouraging interaction with others to create a supportive community early in the process" (LINK 20-21). Another student noted that the OLCDM successfully circumnavigated their previous challenges of getting to know others:

> The Link has helped me to get to know my cohorts in a way that would take months in a classroom setting. The 'getting to know you' forum enabled more communication and team building than any face-to-face activity because lack of participation due to shyness was not an option. For me it was very difficult but also comfort zone expanding and rewarding (LINK 17-18).

An additional common thread throughout the feedback was how getting to know their peers during the OLCDM enabled students to develop trusting relationships quickly, "creation and sharing of the videos gave me a much clearer view of my cohort and helped me to feel more comfortable in the program; felt like I was now studying with 'real' people" (LINK 18-19). Another student also remarked that, "it allowed us to interact with our classmates early on ... we were all learning together, so we weren't afraid to ask questions." (LINK 18-19), and a MAIS student noted, "it was a great way to ease into the MAIS on-line environment by sharing stories, backgrounds and aspirations for the future" (MAISCON 21). The trust that was established so early in the OLCDM benefitted students later on; one participant found that, "when we did the Annotated Bibliography as a group it was easier to trust the people I was working with because we already knew a bit about them" (LINK 15-16).

The familiarity and trust established in the OLCDM led to participants being able to build strong connections and appreciate what their peers brought to the table, providing opportunities for them to learn from each other, as well as from the coursework. One student noted that the OLCDM was, "such a great experience to introduce me to the program and my colleagues! I am now SO excited to meet these people in person! I feel much more relieved about the whole experience and feel excited to be a part of such a unique cohort!" (LINK 15-16).

Collaboration. Another topic that was heavily discussed was how the OLCDM helped students collaborate. One student found that "the Link effectively engaged students, allowing for the development of teams, rather than the interaction of colleagues." (LINK 20-21). Another emphasized the importance of teamwork in the OLCDM noting, "the most valuable piece of the Link was the low-pressure team assignment" (LINK 20-21). Yet another student found the early teamwork to be critical, stating, "it helped by putting students to work in virtual teams immediately" (LINK 16-17).

Other students appreciated how the collaboration facilitated by the OLCDM would serve them well going forward, with one remarking "I am sure this course is going to have a positive impact on my future team projects" (LINK 20-21), and another that, "it was very useful that the Link incorporated information on conflict management and served as a strong introduction to team-based projects" (LINK 19-20).

Students also noted how the tools introduced in the OLCDM helped to build and facilitate collaboration. "Using a tool that we were not as familiar with forced us to discuss the tool and

actually communicate with each other" (LINK 17-18). In addition, a student in a different cohort noted that:

> Activities encouraged us to (a) use technology and (b) get to know our peers in a safe environment. Teamwork focused us on how to use a specific type of technology for the project ... more importantly we learned first-hand through the group work the challenges and strengths of working together. As a team, we had to 'figure' it out. Life learning … was far more valuable than reading about it. Learning really happens when people participate and this environment allowed us to understand the environment and to feel supported. (LINK 18-19)

Another student found that, "the collab rooms were amazing for online collaboration" (LINK 19-20), with an additional student remarking that they valued "being able to communicate with other team members through forums" (LINK 18-19).

Building Community. One student stated that the OLCDM was a "FAST way of building a supportive community… learners exchange their pre-course excitement. Simple. Brilliant" (LINK 15-16). Another student found that the Link "was a great opportunity to get a feel for the program and to have the chance to interact with classmates. It definitely helped support community and connection" (LINK 18-19), while yet another student remarked that, "I think that these activities were wonderful in developing a learning community" (LINK 15-16).

Students also found that the asynchronous video introductions and face-to-face synchronous discussion were a great way to build their learning communities. Different students from the LINK 2017-18 cohort remarked, "meeting everyone Face-to-Face via video was really great, I was able to form a connection to all students and now have a face to put to the name", "[the LINK] really helped to build a supportive online community through the video introductions and through online collaborations", and "by creating an online profile in Moodle as well as an introduction video, this helped to establish a connectivity between all the participants".

Knowledge of Resources. Because students came from a multitude of backgrounds, with varied levels of experience with technology, a critical piece of the OLCDM was establishing a base knowledge of the tools, technologies, and support resources offered at the university. Some students found that the OLCDM successfully achieved this, stating "the Link enhanced my supportive learning in that each person was introduced to different resources available to facilitate your learning" (LINK 17-18), and another noted that, "I was able to learn a lot about new online tools for collaboration and I was very impressed with every member of the program and how supportive the environment felt" (LINK 18-19). In a different cohort, a student observed that, "understanding what support is provided, especially the library and writing center was excellent" (LINK 20-21). In addition, a student emphasized how developing a knowledge of the resources early impacted their confidence and their ability to be successful, remarking that, "the Link was helpful because I will now enter my program courses strong and confident. I have a good idea of resources available and who I will be working with" (LINK 19-20).

Low-stress Environment. Because the OLCDM was not graded, it provided students with a stress-free environment where they could develop relationships with their peers, build

community, and experiment with the various tools that they would be using later. As one student observed, “it is a good place to make mistakes” (LINK 15-16).

What Could be Improved

Logistics and Scheduling Inflexibility. Because the participants in all these programs were often working professionals with obligations, flexibility was important. Students who wanted to collaborate synchronously on team activities found that living in different time zones limited their ability to engage with each other in real time. One student commented that, “I felt there perhaps could have been greater understanding that the people taking this course would be working full-time jobs” (LINK 19-20). Although the class-wide synchronous sessions were always recorded, another student expressed disappointment about the scheduling, noting that “I wasn’t able to attend any of the Collaborate sessions because they were all held in the middle of a workday” (LINK 19-20).

Module Activities and Content. A few MALAT and GCID students identified inconsistencies in the instructions across the technology platforms to be a source of frustration. One student remarked that “the annotated bibliography project had some inconsistencies in instruction (in one location the instructions [were] for one way and another they were different) this definitely cause some frustration on my team” (LINK 18-19). Another emphasized that the module administrators must take care to “make sure that due dates are accurate across the platform” (LINK 16-17) and yet another noted that it was important “that instructions are clear and accurate amongst the platforms” (LINK 16-17).

Some students felt that not all the module content was applicable to their academic journeys. One student noted that, “I didn’t care for the sessions about the on-campus services. I will not be on campus for any of my program, so I felt the information was not required” (LINK 18-19). Another in a similar circumstance stated, “as a student attending RRU virtually, there were many components of the Link that I felt didn’t apply to me, and the information supplied didn’t apply to me” (LINK 19-20).

What Could be Added

Re-structuring. A common suggestion by students was a restructuring of the OLCDM, namely in a way that would consolidate resources, activities, and instructions into one location. One student suggested implementing “one clear page with access to everything!” (LINK 16-17), with another noting that “choosing one tool keeps things organized and reduces the chance that learners miss expectations” (LINK 16-17), and another stated, “a discrete schedule of tasks and activities in a simple checklist or calendar would be helpful” (LINK 16-17). A student had a similar suggestion, “streamline into one platform to use, and a list of supporting platforms [so] that students will need on[ly] one list … so that we have a list of websites we will be required to [use] from the start to get familiar with” (LINK 20-21). Other suggestions for restructuring the module included adding “short 10 min videos with quick quizzes” (LINK 18-19), “maybe the case studies could be a Moodle quiz instead?” (LINK 15-16), and one MAIS student commented that “I’d love a short video of previous MAIS students sharing an overview of their thoughts on what Interdisciplinary is [and] how they brought it to life” (MAISCON 21).

Greater Collaboration. There were also concerns expressed by students who felt limited by being put into teams, and that they would appreciate the opportunity to work with more of their cohort. This is summarized by one student's comment, "I only feel connected to the person I worked with in my group. I think a collaborative online session with the entire group would have been more beneficial … a truly collaborative session where everyone talks/asks questions" (LINK 19-20).

Recommendations

When examining the impact of online activities on the development of learning communities for new-to-program students, it is evident from the findings that both individual and team activities play a significant role. Students found the three OLCDM activities, Creating Online Presence, Annotated Bibliography, and Building Community, supported their efforts to collaborate and communicate with others, which in turn helped them build relationships with their fellow students. Building on our analysis of the findings, we propose that there are six areas for consideration when designing similar modules to support new-to-program students developing supportive online learning communities:

1) Make the module mandatory for all students in a cohort.
2) Provide module activities and content that allow students to engage with each other, making use of video-based technologies that support synchronous and asynchronous communication and collaboration.
3) Create a low-stakes, preferably not-for-credit, environment where students feel safe to interact freely with their peers and experiment with the tools available to support their learning experience.
4) Allow opportunities for students to collectively become familiar with university and program resources.
5) Streamline the content and activities so that they are easily accessed and utilized by students from one digital location.
6) Consider complications that may arise for students working in different time zones and needing to balance responsibilities associated with family, work, and education.

Summary

There are numerous benefits to creating digital learning environments in higher education institutions. Online education provides students with the flexibility to learn from a location of their choosing, provides opportunities for working at different times of the day and in different time zones, and allows people with differing levels of social comfort to communicate in a way that best meets their needs. In addition, by increasing flexibility for students, online education reduces the barriers to obtaining academic designations, which in turn decreases both the financial and scheduling burden students may experience when compared to on-campus learning. Online learning environments may also provide a more inclusive space for students with social anxiety.

However, given the ubiquitous use of online learning in higher education, it is also paramount that institutions help students create supportive learning communities online to facilitate the

learning of core program concepts, and allow students to develop lasting, meaningful connections with each other to deepen their learning experience. While there is debate in the literature about the extent to which students can develop learning communities online, the OLCDM investigated in this research shows that activities can be used to help students develop supportive learning communities online. The findings from this research conducted over an eight-year period illustrate that with thoughtful design and facilitation, community and connection can be built online, and that the isolation felt by some online learners can be mitigated by activities that foster relationship-building, teamwork, and connection.

Guided by the findings from this research, improvements focused on logistics and scheduling to accommodate students who work full time, and advances related to module re-organization centred on flow and clarity, will enable the OLCDM to continue as a valuable online learning experience that supports new-to-program students. By sharing the open educational resource (OER) version of the OLCDM, we invite others to use, modify, and contribute to this research by supporting new online learners as they realize the benefits of developing online learning communities. The OLCDM OER may be accessed at the following web address: https://oer.royalroads.ca/moodle/course/view.php?id=48.

Author's Contributions

Jo Axe was responsible for conceptualizing the original research idea, refining the original research idea, contributing to the literature search, creating the original survey, refining the survey, analyzing the data, and contributing to the writing of all sections of the manuscript. Contributed to the restructuring of the paper to incorporate reviewers' suggestions.

Hannah Dahlquist-Axe was the Research Assistant for this project. She was responsible for collecting and analyzing the raw data from the LINK and MAISCON survey responses and determining the themes within the data as presented in this paper. She provided the foundational outline for the paper, and wrote the introduction, literature, methodology, findings, and recommendations sections with the support of JA and EC. Contributed to the restructuring of the paper to incorporate reviewers' suggestions.

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Ethics Statement

Ethical approval was obtained through Royal Roads University Research Ethics Board on January 30, 2014, with annual ethics renewals being obtained each year. The most recent renewal was received on January 24, 2022.

Conflict of Interest

The authors do not declare any conflict of interest.

Data Availability Statement

The data used in this study will reside with the authors as per the confidentiality statements agreed to in the participant survey consent forms.

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