International Journal of E-Learning & Distance Education
La Revue internationale de l'apprentissage en ligne et de l'enseignement à distance
ISSN: 2292-8588 Vol. 35, No. 1, 2020

This is why we do it: Using a Design Based Approach to Optimize Student Learning in an Online Discussion Based Course

Teresa Avery, Alexandra Makos, Wafa Sarguroh, Preeti Raman, and Dr. Clare Brett

Abstract: The need to deliver good online courses has intensified due to the COVID-19 pandemic, with the surge in online education. Teaching online is a different experience from that of teaching in a face-to-face setting. In an online course, careful prior planning and course design is crucial to student success and a well-designed online course is essential to support students' learning experiences. One way to design an effective, fully online course is to think about the student learning cycle (Lawson, 2001; Kolb, 1984; Carver et al., 2007; Murphrey, 2010; Bassanjav, 2013) well before the course begins, which gives instructors time during the course to interact with their students. To better understand how course design and an instructor's activity affects the students' learning cycle, we explored students' learning cycles across three instances of a graduate-level online course offered at a leading education institution in Canada. In this paper, one instructor's use of a learning cycle across the three courses is studied, by mapping the instructor's activity to student activity. Using data from the LMS PeppeR[1], we focused on mapping the planned learning cycle across the three offerings. The results revealed that students found their rhythm online and it was was relatively consistent throughout the course, until week 7 when they became more focused on the final project. Also, we found that having a well-

[1] PeppeR is a discussion-based multi-media environment developed in-house at OISE that is a research and teaching tool available for use by the whole University of Toronto

designed learning cycle in place gives the instructor a clear framework in which to further individuate the instruction during the course. This case study will be used as the foundation for conducting a larger analysis of online courses that employ learning cycles as a model for facilitating cognitive, social and teaching presences.

Keywords: teaching online, online course, online learning, course design, instructional design, learning cycle, community of inquiry, COVID-19

Résumé: La nécessité d'offrir de bons cours en ligne s'est intensifiée en raison de la pandémie de COVID-19, avec la montée en flèche de l'éducation en ligne. L'enseignement en ligne est une expérience différente de celle de l'enseignement en face à face. Dans un cours en ligne, une planification préalable et une conception de cours minutieuses sont essentielles à la réussite des étudiants et un cours en ligne bien conçu est essentiel pour soutenir les expériences d'apprentissage des étudiants. Une façon de concevoir un cours efficace et entièrement en ligne est de penser au cycle d'apprentissage des élèves (Lawson, 2001; Kolb, 1984; Carver et al., 2007; Murphrey, 2010; Bassanjav, 2013) bien avant le début du cours, ce qui donne le temps aux instructeurs d'interagir avec leurs étudiants pendant le cours . Pour mieux comprendre comment la conception des cours et l'activité d'un instructeur affectent le cycle d'apprentissage des étudiants, nous avons exploré les cycles d'apprentissage des étudiants dans trois instances d'un cours en ligne de niveau supérieur offert dans un établissement d'enseignement de premier plan au Canada. Dans cet article, l'utilisation par un instructeur d'un cycle d'apprentissage à travers les trois cours est étudiée, en mappant l'activité de l'instructeur sur l'activité des élèves. En utilisant les données du LMS PeppeR, nous nous sommes concentrés sur la cartographie du cycle d'apprentissage prévu à travers les trois offres. Les résultats ont révélé que les étudiants trouvaient leur rythme en ligne qui était relativement constant tout au long du cours, jusqu'à la semaine 7 où ils se sont concentrés davantage sur le projet final. De plus, nous avons constaté que la mise en place d'un cycle d'apprentissage bien conçu donne à l'instructeur un cadre clair dans lequel il lui permet d'individualiser davantage l'instruction pendant le cours. Cette étude de cas sera utilisée comme base pour mener une analyse plus large des cours en ligne qui utilisent les cycles d'apprentissage comme modèle pour faciliter les présences cognitives, sociales et pédagogiques.

Mots-clés: Menseignement en ligne, cours en ligne, apprentissage en ligne, conception de cours, conception pédagogique, cycle d'apprentissage, communauté d'enquête, COVID-19

Introduction

This research is especially significant because as online course offerings and requirements increase, even more so in the wake of COVID-19, instructors are looking to make good decisions—considering what ways of interacting with their students are most effective. Instructor-student interaction is one of the most important and most time-consuming aspects of online teaching (Mandernach, Forrest, Babuzke and Manaker, 2009; Tomei, 2004). Instructors who previously taught face-to-face may now find online teaching challenging: for example, managing the constant email communication and other aspects of online teaching and learning require both more immediate and more ongoing attention (Sword, 2012; Mandernach, Hudson and Wise, 2013). Part of the challenge for online instructors, yet also a factor in making online learning potentially very valuable, is the student-centered approach of online learning and potentially often more individualized attention of instructors to students' development of ideas (Cavenaugh, 2005).

Effective fully online courses can be designed in advance to allow in-course reflection and feedback if instructors think about the student learning cycle well before the course begins. In this context, a learning cycle is a type of suggested schedule, created in advance by the instructor, with built in affordances for students to navigate the course mapped onto the weekly calendar. A learning cycle is a way that instructors help students organize and manage their time. In this case, the learning cycle in a fully online course is a way to integrate continuity of experience and interaction (Baassanjav, 2013 from Dewey). E-learning, and more specifically experiential e-learning, is a way to

align a technology-based environment with experiential learning and to allow space to emphasize practical experiences of learners (Carver et al., 2007; Murphrey, 2010).

Even when the instructor is not strictly following a prescribed experiential learning process, the instructor can overtly each support the learner by actively scaffolding how observation translates into action. Kolb's (1984) experiential learning process emphasizes the process of concepts being continually modified by experience. As an instructor overtly designs a learning cycle that allows time for application and reflection, they are also allowing time for leaners to understand a novel or developing reference point. Learners in an online environment can be given space to reflect on new knowledge, through interaction with others and in their own environment. This process, when thoughtfully embedded in the learning cycle, enables learners to begin to form initial theories or conceptualizations and also to use these theories in practice to solve problems. Time is needed in the learning cycle to develop new ideas, which can reveal new perspectives or even contradict previous thought processes. In a learning environment which has a cycle of learning, reflecting and even resting, the instructor can allow time and thinking space for learners to begin to negotiate types of actions and perspectives stemming from the knowledge they are acquiring (Baasanjav, 2013).

Thinking through the learning cycle is also a way that instructors can allow for more focused teacher presence and facilitation during the course. As a suggested schedule, the learning cycle sets the expectations for engagement for the student and the instructor with each other, with the course content, and with other students in the course community. In short, a good learning cycle in a fully online course can be the key element that pulls together elements of a Community of Inquiry (COI), cognitive, social and teaching presence, in a practical way. Given the current situation, with students and instructors having less choice about their course delivery mode and environment,

having a way to approach both teaching and learning effectively helps balance competing demands for attention.

This case study follows one instructor's use of a learning cycle in her graduate course on instructional design of online courses at a leading education institution in Canada. It is helpful, as an instructor, to consider what is planned in a learning cycle, and then to look at what actually happens in the course.

This case study explores the research question: What can instructors learn from the ways that student activity coincides with an instructor-planned learning cycle?

The logged data from an online learning management system is explored with the intention of exploring what is going on, and suggesting ways this data can shape instructor modelling and decision making in the course design process. A thoughtful and responsive instructor is at the heart of a good online course, just as in a good traditional course. Online researchers are increasingly aware of the importance of the framework for decision-making that each instructor brings into the online discussion and course creation (Lack, 2013; Hiltz, 1994, 1994; Garrison, Anderson, Archer, 2010; Avery, 2018). This case study will be used as the foundation for conducting a further, larger analysis of online courses that employ learning cycles as a model for facilitating cognitive, social and teaching presences in a COI.

Background of the Instructor/Researcher

[The instructor] is a researcher and instructor at a [public Canadian University in the department of Curriculum Studies and Education]. She has been working as an instructional designer for over 8 years in the higher education sector. Her experience in online and flex learning course design is a product of her research and professional experience, teaching dozens of courses at the graduate level at OISE.

Recently, her research focus has been exploring the role of how the COI model is represented and enacted in online, discussion-centric learning experiences. The focus of this research trajectory is to better understand how social affordances in learning environments are purposefully mobilized in instructional (and course) design. Her working hypothesis is that one way to address the misconception of needing to replicate face-to-face in online learning contexts is to increase our understanding of how to most effectively embed cognitive, social and teaching presences into online learning systems using the tools in an LMS with a focus on design.

Literature Review and Theory

This idea of an instructor-created learning cycle is situated in a social constructivist framework which gives value to learners individually and collectively constructing meaning within a learning community. Although online learning research is not bound by a single, unified theory of learning (Tallent-Runnels, et al., 2006), literature about online learning and design does present some workable best practices for courses inspired by models such as the COI. A COI framework emphasizes pedagogical processes that support deep, meaningful discourse at the intersection of these three elements: social presence, cognitive presence and teaching presence (Garrison, Anderson and Archer, 2000). No single approach seems superior at all times, for all learners, but the use of instructional design processes to guide the design and development of online courses is an effective practice (Martin, et al., 2019; Oztok, et al., 2014). Specifically, a COI model is comprehensive, providing a way to see online learning as it evolves from the interaction of student, instructor and the learning environment: providing "a dynamic way to explain learning within a computer mediated environment" (Avery, 2018, p. 36). A learning cycle can be carefully designed before, facilitated with intention during, systematically evaluated after, and revised

accordingly to support learning objectives (Martin, et al., 2019; Martin et al., 2018; Rovai, 2002).

Design Has Always Been Important in Online Courses

Early online courses were very teacher centric. They were not taught with a social-constructivist framework in mind, or with attention to what students discussed and learned together. The structure, transparency and communication potential of course designs have always heavily impacted student satisfaction, learning and retention in online courses (Romiszowski and Cheng, 1992; Eastmond, 1995; Irani, 1998). Yet, earlier online courses were just a way for instructors to disseminate course content to students at a distance. Courses used radio broadcasts, mail services, and even delivery of a set of cassettes that were loaned for the duration of the course. As the world wide web improved communication channels, educators were also becoming aware that disseminating information was not, in fact teaching (Shank, 1998). As learning, and learning at a distance, developed, some of the concepts identified and extrapolated from computer-based learning and multimedia design were also applied to the development of effective online or web-based instruction including: using a variety of presentation styles, having a consistent layout, applying clear navigation and an adding a help menu (Swan, 2001; Tennyson, 1989; Jonassen et al., 1995; Ward and Lee, 1995).

Learning Online can be Framed within a Community of Inquiry

About 20 years ago, Anderson, Rourke, Garrison and Archer framed what was happening in some courses as a COI (Anderson, Rourke, Garrison, Archer, 2001; Garrison, et al., 2000). The interactions that seemed effective online were grouped into what they called 'presences': cognitive, social and teaching. Recently, Garrison revisited his COI framework and validated an increased confidence [for] using this framework to study collaborative approaches to deep and meaningful inquiry (Garrison, 2018; Dempsey and Jang, 2019). In COI, while these three key presences are highlighted, the

"best" learning is understood to occur at the intersection of these three elements: social presence, cognitive presence and teaching presence (Oztok, et al., 2014). This model is still considered one of the most comprehensive in the field of online learning. It takes social constructivism and the unique nature of online learning into account: "COI sees learning as inherently collaborative and constructive and provides a dynamic way to explain learning that takes place within a computer mediated environment" (Avery, 2018, p.8). The case study analysis reported in this paper will be used as the foundation for conducting a larger analysis of online courses that employ learning cycles as a model for facilitating cognitive, social and teaching presences.

Teacher Presence Before the Course Begins is Imperative

Within the three presences of a COI, teaching presence can be emphasized in the planning and facilitation of an online course. All the presences are deeply connected, but, in this study, teaching presence, is integral to an effective learning cycle and very much represented before the course even starts. Teaching presence is often conceptualized as occurring at the intersection of teaching and social presence (Richardson, et al., 2015); teaching presence is part of the scaffolding by the instructor to develop and support valuable learning experiences and activities (Bangert, 2008; Garrison and Arbaugh, 2007; Richardson, et al., 2016). Teaching presence is evident in the instructor engaging in design, facilitation and setting the direction of the course; teaching presence describes how the instructor communicates information to the learners in a way that is meaningful and productive (Swan, Garrison and Richardson, 2009; Garrison, Anderson and Archer, 2009; Shea and Bidjerno, 2010).

Planning a learning cycle before a course starts allows an instructor to concentrate on having an effective presence during the course. An instructor with an effective presence in the course, beyond live sessions and even written communication, has taken time to organize and frame a learning cycle early and to select relevant course content that

integrates learning activities, assignments and assessments in a meaningful way (Budhai and Williams, 2016; Garrison and Anderson, 2003; Garrison and Cleveland-Innes, 2005). The most effective way to build teaching presence in an online environment is to be proactive and the development of community, including purposeful, well-supported assignments, is key (Budhai and Williams, 2016, p. 78). Teacher presence is infused throughout all aspects of the course, entailing the process of facilitating, designing, and guiding the cognitive learning processes in a meaningful way (Rourke, Anderson and Garrison, 2001; Garrison, Anderson and Archer, 2000; Swan, 2001). Developing a learning cycle and promoting student-centered learning online is an extremely intentional process; it does not just happen ad-hoc (Budhai and Williams, 2016, p. 77). Teacher presence is most easily seen during the course, in direct instruction, during feedback, and from ongoing comments and announcements. However, teaching presence substantially takes place in the intentional design of the course before the course even begins. Front-loading a course, putting in considerable time mapping a learning cycle that allows time to consider, apply and even revisit new learning material, is paramount in allowing the instructor time, during the course, to be meaningfully involved with the students' unique interactions and learning.

A Systematic, Organized Design is a Way to Front Load Teacher Presence

Successful online faculty approach the design of courses in a very systematic manner: beginning with the course description and objectives and drafting a syllabus before working on the online course (Martin, et al., 2019; Rothwell and Kazanas, 2011). Student learning experience is positively impacted when discourse, assignments and introduction of content is facilitated in an intentional way (Budhai and Williams, 2016; Hosley and Arend, 2012).

Planning of the course includes clearly articulating the course objectives, breaking these down into modular or weekly topics (also called chunking), and then including relevant

resources in different formats which align with these subtopics. For example, instructors can first think about what they expect students to know, what they expect students to do in order to learn, and how student will demonstrate what they've learned (Martin, et al., 2019). Lesson planning should not be done in isolation from long term goals. Backwards design enables students to use content, to make new connections and transfer information or to demonstrate intelligent use of the content acquired. Think of this sports analogy: you haven't 'gotten' it unless you can 'see it' and 'use' it 'in the game' (Wiggins, 2009).

Being systematic and planful is also key. One consistent key tenet in designing and delivering online learning is the importance of pre-planning how to communicate clearly the student learning outcomes, types of assessment (Moore and Kearsley, 2011; Martin, et al., 2019), and the expectations of members of the learning community. Contemporary dialog around assessment not only highlights the need for diversity of methods of assessment (Sun, Tsai, Finger, Chen and Yeh, 2008) but also for assessment that is linked to real world problems and application of knowledge (Conrad and Openo, 2018; Martin, et al., 2019).

Also, having a structure for the content and outcomes creates a guide for the students and helps them to understand why they are doing certain things within the course: "a continuous educational pathway...[that]...increases their self-efficacy" (Martin, et al., 2019). The course syllabi ideally are visually appealing. They can even include videos or screenshots of how to access components of the course or the LMS. A good syllabus is a road map and often embeds interactive components such as working links to other important documents. When the syllabus is not readily accessible, or is not laid out in an organized, accessible manner, then students do not spend much time on this important guide for their course (Richards, 2003; Martin et al., 2019).

Successful faculty have different ways to organize the sections of their course: by week, by module, or by topic. The idea of "chunking" content meaningfully as a way of consistent organization is important and helps students to know where they are, and where they are going in the course (Martins, et al., 2019; Ko and Rossen, 2017). Students also place value on having a good course organization (Fayer, 2014; Young and Norgard, 2006). Part of planning the course is to also plan ways within the course to consistently communicate what needs to be done and how a student can structure their time in order to get that work done (Martins, et al., 2019). Backwards design or aligning the syllabus, learning outcomes, assignments, learning activities and learning technologies with expectations and objectives is key (Martin, et al., 2019; Wiggins, Wiggins and McTighe, 2005).

In Course Communication via Announcements

One way that instructors "talk" to students during the course, and enhance their teaching presence, is through timely announcements. Announcements are like saying "hello" and providing an orientation to the lecture in a face-to-face classroom: a way to let students they are not alone and that an instructor is there to support them through their tasks (Ko and Rossen, 2010; Martin et al., 2019). Scheduled announcements, often at the start of a week or chunk of learning, serve a few purposes: they get the student's attention, they update the group about where they are in the learning cycle, and they often point to what is coming up for assignments and other course requirements, helping students manage their time (Martin et al., 2019; Kelly, 2014). Instructors can be informed from other offerings of the same course about certain types of questions students usually have at certain points and can prepare in advance for responding to these inquiries (Martin, et al., 2019).

Research Design and Methods

This research aligns with [Author's] current SSHRC Insight Grant which is focused on identifying the most promising opportunities for maximizing learning environments, as opposed to letting course design be guided by financial and technological imperatives (Brett, 2016).

Online Environment

Data was collected from the University-created online tool. [The researchers] created this online environment over 10 years ago for the purpose of researching online collaboration. The platform provides educators and researchers a behind the scenes look at collaboration and student activities such as reading, time spent online and other online activities often associated with online learning communities (Brett, 2016, p.3). Also, PeppeR is dynamic: "continually being constructed and further developed by the learners and the faculty in a knowledge community which extends beyond the borders of a traditional classroom" (Avery, 2018, p.11). PeppeR is one online platform that lets an instructor visualize data about the course, a behind the scenes view, that can help them make decisions about how the course is flowing or about more fine-grained interaction data (e.g. being able to see which students are posting new ideas but failing to engage with peers by replying to their content). Using reflections about the data from course interactions "it's relatively easy to create a comprehensive record of interactions, opening the process to academic study with the aim of improving the design of learning environments and developing best practices to support participants" (Fried, 2016, p. 1). Instructor feedback about their intentional modelling and perceptions around student behaviours in discussions will add another layer to the investigation. The graduate course selected for this case study, *Instructional Design: Beyond the Lecture*, was designed as an opportunity for students to focus on knowledge mobilization by bridging the gap

between research and theory in instructional design and its practice. It models many of the best practices in instructional design for online courses by providing a clearly planned and cohesive learning experience (Standards from the Quality Matters Higher Education Rubric, Sixth Edition, 2018). Planning of the course is front- loaded, with much of the work begin completed before the course start date. This permits for the researcher/instructor to engage with students in a more meaningful way, rather than having to focus on a concurrent course development or a reactionary course development model that we have seen in recent months in response to the COVID-19 pandemic.

Data Source

This case study focuses on three instances of one graduate course at the Ontario Institute for Studies in Education titled: *Instructional Design: Beyond the Lecture.* The course is offered multiple times a year, but this study uses data from three instances: the Winter 2019 (30 students), Fall 2019 (29 students) and Winter 2020 (29 students) course offerings as all three of these instances were delivered using the same learning cycle, follow the same weekly topic sequence and reading list, include the same evaluation scheme for assessed learner experiences (emphasis on discussion-based learning throughout the 12-week term), and use the same media content produced by the instructor (Caskrulu, Richardson and Maeda, 2019; Cresswell, 2012; Cresswell and Poth, 2018; Yin, 2014). Anonymized data associated with the discussions that ran from Weeks 2–11 of the course were extracted from the log files of the LMS, Pepper. The three syllabi were used as reference in this study as well as the official academic calendar from the institution. Additionally, the instructor exported all announcements made in each of these courses as sources for demonstrating teaching presence.

Research Design and Methods

This exploratory case study looks to answer the research question: *What can instructors learn from the ways that student activity coincides with an instructor-planned learning cycle?* The research also includes reflection from the instructor which can help guide other instructors who are looking to find ways to design effective courses and to manage their own course instruction time while allowing space for teacher and student in-course interaction.

Data for the three course offerings were extracted from Pepper log files using multiple extraction scripts. Below is a breakdown of the two scripts used and a description of how the data was cleaned. Cleaning data is a way of taking out information that is not relevant to the analysis, in this case data from weeks that did not require collaborative discussions. Taking out the irrelevant data helps the researchers look more closely at the weeks of the course that are relevant.

The "Summary" extraction script was used to output the following metrics for each student across each offering of the course which provided us with data for descriptive statistical analyses. The variables used for the purpose of this research were the following:

- Total active students in the course
- Total notes produced by students
- Total number of notes read by students
- Total number of likes given to students' notes
- Total number of links made to students' notes
- Total number of replies to students' notes

The "Dump Note" extraction script was used to output the following metrics for each note posted in each of the courses provides us with fine grain data for descriptive statistical analyses. The variables used for the purpose of this research were the following:

- Date of note creation
- Date note was last saved
- Note title
- Number of times the note was revised
- Person ID of the note author
- Author Type (student, or instructor)
- ID and name of the folder that the note was posted in
- Indication if the note is a reply or not
- Total number of replies to the note
- Total number of times the note has been liked

The log data from the Summary script were cleaned for each course where data were sorted by course instance and reviewed for any data points that would have indicated dropping a course or student duplication. None of the Summary logs required cleaning; a total of 78 students were included in this study as all students enrolled in the course were able to complete the course. The log data from the Dump Note script was cleaned for alignment with the course schedule. Student moderated discussions ran from weeks 2 through 11 in the 12-week course, so the log files were refined to online include instances where notes were posted in folders for those specific weeks – the titles of the folders in which a note is posted was used as the filter here. The date that notes were posted may not align to the weekly folder name because all discussion folders

intentionally remain open for posting access throughout the course permitting students to go back into a folder before or after the weekly topic has begun or concluded.

Data sources in addition to the extraction scripts, included the course syllabi, the data logs containing announcements from each of the three courses, and the institutional academic calendar for the 2019 and 2020 terms. The course syllabi were used as a tool to compare the design of each of the offerings (including the course assessment maps and learning outcomes for students) along with the announcement logs and cross referenced to include important date markers in the institutional academic calendar to improve course alignment and flow. The course syllabi explicitly call attention to the learning cycle as a way for students to map the course interactions onto their own planning for the week.

Please see the excerpt from the syllabus below regarding the learning cycle: it is important to note that the learning cycle describes how it is to be used by students in the course:

Learning Cycle

> Our course runs throughout the week Monday–Friday. I have created a learning cycle for you to follow throughout the week to help you manage the workload in the course. If you are a part-time student/work during the days, I highly recommend you complete the readings by/on Monday and try to post your responses to the discussion earlier in the week so that you are actively participating.
>
> **Monday:** Read the resources for Week X. If you are a moderator for the week, post moderator questions in Week X folder by Monday at midnight.
>
> YouTube Webinar videos—these are all available in advance and will run about 15min. You can watch this at your own time, but I recommend it be viewed before beginning the discussions.

Post executive summary note: if you were a discussion moderator in the previous week, post the discussion summary note in your discussion folder by the following Monday at midnight.

Tuesday–Friday: Engage in student-moderated discussion on Pepper.

Weekends: Free to play and spend time doing something that invigorates you.

N.B. If you think of this course as part of your academic work and schedule it into your calendar, then you have time carved out a few days of the week (~45min a couple of days for the online discussion, totalling ~2 hours) where you know you can sit down and participate in the discussions.

All data sets for each of the courses were merged to create three master course data files in Microsoft Excel and descriptive statistical analyses were run. The research question was addressed with an exploratory analysis. Outputs were exported in the results below and provide a preamble to the discussion of the findings. The researchers also added instructor reflections in order to have another layer of information in this exploratory case study.

Findings and Results

What can instructors learn from the ways that student activity coincides with an instructor-planned learning cycle?

Learning Cycle-based Observations

A total of 78 students participated in three offerings of the course examined in this case study. The learning cycle developed by the instructor was the same for each offering, please see Table 1 for the cycle description.

Table 1

Course Learning Cycle

Day of week	Student Activity Expectation
Monday	• Interact with course content for the week (read/watch materials in course outline) • Watch the weekly video that the instructor has posted • If student moderating the weekly discussion, prepare for moderation o Post executive summary of the discussion if moderated the previous week's discussion
Tuesday—Friday	• Engage in student-moderated discussion
Weekends	• Free time

Student activity was broken down over each week of the course for each of the three offerings. There were fairly consistent weekly activity patterns across all three offerings: student activity online on Mondays was low compared to the rest of the work week (it should be noted that the winter 2019 and 2020 offerings had a lower number of notes produced on Mondays compared to the fall 2019 offering); students were most active on Wednesdays through Fridays; the number of notes posted are significantly lower on weekends (less than 4% of notes were generated on weekends). The reduced online activity for Mondays is consistent with the advice for managing the course activity summarized in Table 1 above, similarly to the lower levels of activity noted on weekends. Table 2 provides the number of notes posted each week for each of the 12-week courses. Table 3 provides a breakdown of the number of notes posted each day in a week.

Table 2

Number of Notes Posted Each Week for Each of the Three Course Offerings

Week	Winter 2019	Fall 2019	Winter 2020
2	149	115	118
3	143	96	137
4	145	97	133
5	123	104	124
6	148	97	133
7	79	87	98
8	130	90	111
9	116	75	113
10	154	88	85
11	110	84	116
Total	**1297**	**933**	**1168**

Note. Data is representative of discussion weeks 2–11.

Table 3

Number of Notes Posted on Days of the Week for Each of the Three Course Offerings

Course	Total Notes	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Winter 2019	1297	144	160	273	280	318	48	74
Fall 2019	933	42	151	229	260	211	23	17
Winter 2020	1168	67	235	297	226	248	59	36
Totals	3398	253	546	799	766	777	130	127
Percentage	100.00%	7.44%	16.07%	23.51%	22.54%	22.87%	3.83%	3.74%

Note. Data is representative of discussion weeks 2–11.

Announcement-based Observations

Review of the instructor announcements demonstrated efforts to clearly set the pace for the course each week across all three offerings. Announcements were sent the evening before the Monday benchmark for the course, and in instances where assessed elements were due, reminders were also sent. Table 4 provides the number of announcements posted in each course.

Table 4

Number of announcements made in each course

Course	Winter 2019	Fall 2019	Winter 2020
No. of Announcements	38	30	36

Descriptive Statistical Data by Days of the Week

The course learning cycle describes how the instructor expects students to be engaging in discussion from Tuesday through Fridays during weeks 2–11 in the course. Descriptive data analysis isolating for that time period shows that students are most active in the course from Tuesday through Friday. Evidence of discussion engagement was found by breaking down the number of notes generated by day into one of the two types of notes—new notes (initial post in a thread), and reply notes (notes that reply to either new notes or reply notes to generate the characteristic threaded discussion pattern). Additionally, data to describe other ways students are interacting with notes—through liking and linking—were included as these are also indicators of discussion interaction. Table 5 illustrates the total notes generated by type (total, new, reply), and note interaction by liking, and linking each day during discussion weeks (2–11) across all three course offerings. On average, students in the course engage in replying to others notes **80.18%** of the time. Students are also engaging in liking each other's notes, a practice that is an indication of discussion behaviours as students can interact with notes in ways other than creating or replying to them (Makos, 2017).

Mapping the learning cycle onto student activity patterns in the course indicates strong alignment between the expectations for student activity as designed by the instructor and actual student participation.

Table 5

Number of notes generated by type (total, new, reply), and note interaction by liking, and linking each day across all three course offerings

	Day	Total Notes	New Notes	Reply Notes	Liking
Winter 2019	Monday	144	56	88	166
	Tuesday	160	38	122	209
	Wednesday	273	22	251	321
	Thursday	280	27	253	348
	Friday	318	33	285	306
	Saturday	48	10	38	38
	Sunday	74	52	22	41
	Total	**1297**	**238**	**1059**	**1429**
	Percentage	100.00%	18.35%	81.65%	110.18%
Fall 2019	Monday	42	32	10	56
	Tuesday	151	42	109	213
	Wednesday	229	47	182	334
	Thursday	260	45	215	294
	Friday	211	26	185	184
	Saturday	23	4	19	12
	Sunday	17	7	10	9
	Total	**933**	**203**	**730**	**1102**
	Percentage	100.00%	22.37%	77.63%	118.11%
Winter 2020	Monday	67	44	23	133
	Tuesday	235	60	175	422
	Wednesday	297	44	253	467
	Thursday	226	18	208	297
	Friday	248	32	216	308
	Saturday	59	8	51	59
	Sunday	36	13	23	41
	Total	**1168**	**219**	**949**	**1727**
	Percentage	100.00%	18.75%	81.25%	147.86%

Note. Data is representative of discussion weeks 2–11.

Personal Instructor Observations on the Course Experience

The following is a reflection of the course instructor, who is also an author of this paper. The researchers left her account in the first person, as it is more effectively presented in

her own words. This type of reflection, based on the data from the course as well as her own thoughtful planning process, is invaluable for other teachers.

> Each time I prepare to teach this course, I look to past offerings and combine that with student feedback on how to improve the student experience. I have found that including the learning cycle brings clarity to my expectations of the students because it is mapped onto the days of the week, and this activates a type of rhythm/flow for the course experience. The observations that are relevant for discussion are:
>
> - Note production throughout the weeks was relatively consistent and once the discussion groups found their rhythm, engagement of students was relatively consistent over the discussion weeks.
>   - Some exceptions to this were in the Fall 2019 offering when a significant portion of the students (approximately 70%) were new to a graduate program at OISE and were unfamiliar with both the LMS and discussion-based online course dynamics; additionally, the Winter 2020 offering was impacted due to rotating strikes in the province of Ontario followed by changes made as a result of growing concerns around COVID-19—both of these events resulted in an extended set of deadlines for the course assessed experiences.
> - The assessment schedule and learning cycle developed for the course help to regulate and allow students to pace themselves in the course.
>   - Students can find their place in the learning community much faster since the experiences and information offered at the beginning of the course scaffold the discussion-based engagement model.
> - Flow of course is purposeful: the assessed learning experiences and engagement opportunities are accounted for and mapped onto the 12-week course so that the sequencing of topics, discussions and assessments scaffold each other to generate maximum impact across various aspects of COI framework.

    - At the core of teacher presence is my ability to provide as much individualized feedback and support as possible throughout the course—the plan in place allows me to shift focus from content development and management to learning about my students.
    - As a focus on cognitive presence, the course content and timing of assessed learning experiences provides a deeply interconnected course curriculum that allows students to engage in knowledge construction and development in various ways.
    - From the onset of the course, modeling and initial knowledge sharing and exchange are designed to support the development of social presence which then is carried into their discussion-based learning opportunity that begins in the second week of the course.
- Around Week 7 of the course, students begin shifting gears toward thinking about their final design project for the course, and the course content becomes focused more around practical application of instructional design theory.
    - The number of notes tends to decrease after Week 7, and this may be a consequence of students focusing more on their projects—around this time I see a greater number of private messages or emails sent to me for one-on-one support or group support of student projects.
- After March Break in both Winter course offerings, there is an increase in the number of notes produced in the weekly discussions—the break provides students with a rest and reset that is beneficial for them; in the Fall offering, there is no week-long break and I find students feel overloaded and as a result produce less notes to manage their cognitive energy for the remainder of the course.

Discussions, Limitations, and Implications

> Planning consistently within a cycle of learning that works for the instructor and the student because as the instructor you acknowledge the uniqueness of each set of students taking your course at a particular moment in time. [Author], May 15, 2020.

This case study, across 3 iterations of the same courses, and including instructor observation and reflection, highlights important principles around planning for effective delivery of fully online courses. Using a learning cycle, in other words being systematic and planful around content, delivery, and expectations for courses, can help an instructor achieve clarity and alignment and a positive educational experience for learners.

The researchers consider the importance of achieving clarity and alignment in online course design a cornerstone in achieving positive educational experiences for learners, particularly when the COI framework is deeply integrated into the course design.

Again, teacher presence is more than just what takes place within the course. Being systematic and planful is demonstrated in this case, when the instructor front-loaded her course planning and design through creating a learning cycle and effectively communicating this through the layout of the course expectations. So, when an instructor goes beyond simply communicating expectations for engagement, but also situates these expectations into a purposeful course design, like a learning cycle, then students are better able to establish a rhythm to their own learning experience in a course.

Using the results from the case study this research is a first step in exploring course dynamics generated by the purposeful design of course content, assessed learning experience, and engagement opportunities which. At one level, these dynamics and exchanges may seem rather obvious: however, the researchers have noticed that are

often less likely to be examined at this level of detail. The use of a learning cycle to achieve clarity and to allow students to understand how a fully online course is mapped onto a weekly schedule has positively impacted the learning experience for all the members of these three learning communities.

Exploring the quantitative metrics associated with student engagement through the course is one way to confirm that students are using the learning cycle to plan and engage with each other in the course. The students are most active on the days that the instructor has suggested they interact with each other in their discussions (in this case, it is Tuesday through Friday). This instructor openly acknowledges that the weekends are an opportunity for students to reset and provides Monday as the re-orientation day to the next topic in the course. Although there are assessed learning experiences integrated throughout the course, and weaving through the suggested learning cycle for the discussion weeks, it is evident that the overarching design of the course aligns well with the communicated expectations and capabilities for these graduate students to become and maintain their engagement throughout the course.

Another benefit of front-loading or spending time designing a course with a well-thought out learning cycle is the time that the instructor then has during the course to reflect on student actions and interactions as they evolve. The value of this approach is reinforced by the potential increased presence of the instructor in the discussion and their ability to provide more feedback to students throughout the course. The instructor can facilitate, guide and monitor what is happening more effectively when the learning cycle has been set up in advance to allow for this in-course teacher-student interaction.

When educators need to shift focus to understand the dynamics unique to various times in the academic year for courses being delivered (e.g. less familiarity with an LMS due to a higher proportion of new students in a program in the fall term compared to a winter term), it is important to consider how instructors can anticipate and support

these elements. This is especially true in the current global pandemic situation where there is so much anxiety and uncertainty surrounding the innate need to socialize with each other.

When designing or revisiting a course syllabus a few weeks before the course begins, the instructor needs to ask themselves "What has changed since the last time I taught this course?" and consider this from multiple perspectives including:

- The environment or LMS
- Themselves as the instructor—e.g. what have they learned—possible insights from student/course evaluations
- The students—e.g. how have my potential students changed? Particularly at this moment in time, it becomes even more crucial to consider the potential trauma and negative experiences students may be bringing to the course because of the pandemic, and offer additional support and opportunities for discussion and community-building.
- The course content—e.g. have there been any developments in the field and/or advances that require updating the readings and/or assessed learning experiences?

By engaging in this reflective practice and actively adjusting the course to the upcoming class or students, the instructor can identify adjustments and/or changes that need to be made for that course offering. Ultimately, having a well-designed learning cycle in place also gives the instructor a well-thought out framework in which to further individuate the instruction during the course delivery mode. Mindful planning of the course as part of an integrated learning cycle highlights the importance of reflection and professional development in online teaching and learning practice. Each member of the

community will take away different teachings from the course as well, which is another unique piece of this story.

Limitations

These results do provide an indication of an underlying need for students to understand how a course will fit into their daily routines. As with other case studies, one of the limitations of this research is the extrapolation of results to different types of courses. Despite this limitation, the study has highlighted the importance of designing courses with an underlying emphasis on developing clarity and alignment, regardless of delivery mode. It would be beneficial to examine the instructional design and activity of a broader range of instructors and map their course designs to the students' learning cycle, to better understand how a well-designed course and planned learning cycle may positively affect students' learning experience in different ways. Additionally, further studies could include direct feedback from students on their experience of the course design on their studying and learning and sense of community in the course.

Collectively, the results of this case study suggest that developing a learning cycle for fully online courses can provide students with a much-needed sense of structure for their learning experience. Future work will build on this study and further explore a larger sample of online courses that employ learning cycles as a model for facilitating meaningful and enhanced online learning.

References

Anderson, T., Rourke, L., Garrison, R. and Archer, W. (2019). Assessing teaching presence in a computer conferencing context. *Online Learning*, *5(2)*. http://dx.doi.org/10.24059/olj.v5i2.1875

Avery, T. (2018). Teacher Presence and Pedagogy: A thematic interview discussion about online learning. Unpublished master's thesis. University of Toronto

Azevedo, B. F. T., Reategui, E. and Behar, P. A. (2014). Analysis of the relevance of posts in asynchronous discussions. *Interdisciplinary Journal of E-Learning and Learning Objects*, *10*(1), 107–121.

Bangert, A. (2008). The influence of social presence and teaching presence on the quality of online critical inquiry. *Journal of Computing in Higher Education*, *20(1)*, 34–61.

Baassenjav, U. (2013). Incorporating the Experiential Learning Cycle into Online Classes. *Merlot Journal of Online Learning and Teaching, 9*(4), 575–589.

Brett, C. and Hewitt, J. (2016). *SSHRC Insight Grant*. University of Toronto.

Budhai, S. S. and Williams, M. (2016). Teaching Presence in Online Courses: Practical Applications, Co-Facilitation, and Technology Integration. *Journal of Effective Teaching*, *16*(3), 76–84.

Carver, R., King, R., Hannum, W. and Fowler, B. (2007). Toward a model of experiential e-learning. *MERLOT Journal of Online Learning and Teaching*, 3(3), 247–256.

Caskurlu, S., Richardson, J. and Maeda, Y. (2019). *Factors influencing students' online learning experiences: A thematic synthesis.* AERA.

Cavanaugh, J. (2005). Teaching online: A time comparison. *Online Journal of Distance Learning Administration, 8*(1). http://www.westga.edu/~distance/ojdla/spring81/cavanaugh81.htm

Conrad, D. and Openo, J. (2018). Assessment strategies for online learning: Engagement and authenticity. Athabasca University Press.

Creswell, J. W. (2012). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research* (Fourth edition. ed.). Prentice Hall.

Creswell, J. W. and Poth, C. N. (2018). *Qualitative inquiry and research design: Choosing among five approaches* (4th ed.). Sage Publications, Inc

Dempsey, P. R. and Jang, J. (2019). Re-examining the construct validity and causal relationships of teaching, cognitive, and social presence in Community of Inquiry framework. *Online Learning Journal, 23*(1), 62–79. https://olj.onlinelearningconsortium.org/index.php/olj/article/view/1419/786

Eastmond, D. V. (1995). Alone but together: Adult distance study through computer conferencing. In *35th Annual Adult Education Research Conference, Knoxville, TN* (pp. 127–132).

Fayer, L. (2014). A multi-case study of student perceptions of online course design elements and success. *International Journal for the Scholarship of Teaching and Learning*, *8*(1).

Fried, A. (2016). Social network analysis of asynchronous discussion in online learning (Doctoral dissertation). University of Toronto

Garrison, D.R., Anderson, T. and Archer, W. (2001). Critical thinking, cognitive presence, and computer conferencing in distance education. *American Journal of Distance Education, 15*(1), 7–23.

Garrison, D. R., and T. Anderson. (2003). E-Learning in the 21st century: A framework for research and practice. Routledge Falmer.

Garrison, D. R. and Arbaugh, J. B. (2007). Researching the community of inquiry framework: review, issues, and future directions. *The Internet and Higher Education, 10*(3), 157–172.

Garrison, R. and Cleveland-Innes, M. (2005). Facilitating Cognitive Presence in Online Learning: Interaction Is Not Enough. *The American Journal of Distance Education. 19(3)*, 133–148.

Garrison, D. R., T. Anderson., and W. Archer. (2000). Critical inquiry in a text-based environment: Computer conferencing in higher education. *The Internet and Higher Education 2(2–3)*, 87–105.

Garrison, D. R. andAkyol, Z. (2015). Toward the development of a metacognition construct for communities of inquiry. *The Internet and Higher Education*, *24*, 66–71.

Garrison, D., Anderson, T. and Archer, W. (2000). Critical inquiry in a text-based environment: Computer conferencing in higher education model. *The Internet and Higher Education, 2*(2-3), 87–105.

Garrison, R. (September 29, 2018). Validity of COI. The Community of Inquiry Editorials. Athabasca University. Retrieved November 1, 2019 from http://www.thecommunityofinquiry.org/editorial15

Gunawardena, C. N., Lowe, C. A. and Anderson, T. (1997). Analysis of A Global Online Debate and The Development of An Interaction Analysis Model for Examining Social Construction of Knowledge in Computer Conferencing. *Journal of Educational Computing Research, 17*(4), 397–431.

Hiltz, S. R. (1986). The "virtual classroom": Using computer-mediated communication for university teaching. *Journal of Communication*, *36*(2), 95–104.

Hosler, K. A. and Arend, B. D. (2012). The importance of course design, feedback, and facilitation: student perceptions of the relationship between teaching presence and cognitive presence. *Educational Media International, 49(3)*, 217–229.

Irani, T. (1998). Communication potential, information richness and attitude: A study of computer mediated communication in the ALN classroom. *ALN magazine*, *2*(1), 1–12.

Jonassen, D., Davidson, M., Collins, M., Campbell, J. and Haag, B. (1995). Constructivism and computer mediated communication in distance education. *American Journal of Distance Education*, *9 (2)*, 7–26.

Lawson, A. E. (2001). Using the learning cycle to teach biology concepts and reasoning patterns. *Journal of Biological Education*, *35*(4), 165–169.

Kelly, R. (2014). Five things online students want from faculty. *FACULTY FOCUS: Higher Ed Teaching Strategies*. http://www.facultyfocus.com/articles/online-education/online-students-want-from-faculty/

Kolb, D. A. (1984). *Experiential learning: Experience as a source of learning and development*. Prentice Hall.

Ko, S. and Rossen, S. (2017). Ko, S. and Rossen, S. (2017). Building an Online Classroom. In *Teaching Online* (pp. 162–196). Routledge. https://doi.org/10.4324/9780203427354

Lack, K. A. (2013). Current status of research on online learning in postsecondary education. *Ithaka S+ R*, 3. https://sr.ithaka.org/publications/current-status-of-research-on-online-learning-in-postsecondary-education/

Makos, A. (2017). *The like button: A way to explore social interaction in threaded discourse* [Doctoral dissertation]. University of Toronto.

Mandernach, B. J., Forrest, K. D., Babutzke, J. L. and Manker, L. R. (2009). The role of instructor interactivity in promoting critical thinking in online and face-to-face classrooms. *MERLOT Journal of online Learning and Teaching*, *5*(1), 49–62.

Mandernach, B. J., Hudson, S. and Wise, S. (2013). Where has the time gone? Faculty activities and time commitments in the online classroom. *Journal of Educators Online*, *10*(2), 1–15.

Martin, F., Ritzhaupt, A., Kumar, S., and Budhrani, K. (2019). Award-winning faculty online teaching practices: Course design, assessment and evaluation, and facilitation. *The Internet and Higher Education*, *42,* 34–43.

Martin, F., Wang, C. and Sadaf, A. (2018). Student perception of helpfulness of facilitation strategies that enhance instructor presence, connectedness, engagement and learning in online courses. *The Internet and Higher Education, 37*, 52–65.

Moore, M. G. and Kearsley, G. (2011). *Distance education: A systems view of online learning.* Cengage Learning.

Murphrey, T. P. (2010). A case study of e-learning: Using technology to create and facilitate experiential learning. *The Quarterly Review of Distance Education*, *11*(4). 211–221.

Oztok, M., Zingaro, D., Makos, A., Hewitt, J. and Brett, C. (2014). Towards understanding threads as social and cognitive artifacts for knowledge building in online learning. *American Educational Research Association (AERA).*

Richards, S. L. (2003). *The interactive syllabus: A resource-based, constructivist approach to learning*. EDUCAUSE. https://library.educause.edu/resources/2001/1/the-interactive-syllabus-a-resourcebased-constructivist-approach-to-learning

Richardson, J.C., Koehler, A., Besser, E., Caskurlu, S. Lim, J. and Mueller, C. (2015). Conceptualizing and investigating instructor presence in online learning environments. *International Review of Research in Open and Distributed Learning, 16*(3), 256–297.

Richardson, J. C., Besser, E., Koehler, A., Lim, J. and Strait, M. (2016). Instructors' perceptions of instructor presence in online learning environments. *The International Review of Research in Open and Distributed Learning, 17(4),* 82–104.

Romiszowski, A. and Chang, E. C. (1992). Hypertext's contribution to computer-mediated communication: in search of an instructional model. In *Interactive multimedia learning environments* (pp. 111–130). Springer.

Rothwell, W. J. and Kazanas, H. C. (2011). *Mastering the instructional design process: A systematic approach*. John Wiley and Sons.

Rourke, L. and Kanuka, H. (2009). Learning in communities of inquiry: A review of the literature. *Journal of Distance Education*, *23*(1), 19–48.

Rovai, A. P. (2002). Sense of community, perceived cognitive learning, and persistence in asynchronous learning networks. *The Internet and Higher Education, 5*(4), 319–332.

Shank, R. 1998, 'Horses for courses', *Communication of the ACM, vol. 41*, no. 7, pp. 23–25.

Shea, P. and Bidjerano, T. (2010). Learning presence: Towards a theory of self-efficacy, self-regulation, and the development of a communities of inquiry in online and blended learning environments. *Computers and Education, 55*(4), 1721–1731.

Stahl, G. (2010). Group cognition as a foundation for the new science of learning. In *New science of learning* (pp. 23–44). Springer.

Standards from the Quality Matters Higher Education Rubric, Sixth Edition (2018). Quality Matters. https://www.qualitymatters.org/sites/default/files/PDFs/Standardsfromth…

Sun, P. C., Tsai, R. J., Finger, G., Chen, Y. Y. and Yeh, D. (2008). What drives a successful e-Learning? An empirical investigation of the critical factors influencing learner satisfaction. *Computers and Education, 50(4)*, 1183–1202.

Swan, K. (2001). Virtual interaction: Design factors affecting student satisfaction and perceived learning in asynchronous online courses. *Distance Education. 22 (2)*, 206–231.

Swan, K., Garrison, D. R. and Richardson, J. C. (2009). A constructivist approach to online learning: The community of inquiry framework. In *Information technology and constructivism in higher education: Progressive learning frameworks* (pp. 43–57). IGI Global.

Sword, T. S. (2012). The transition to online teaching as experienced by nurse educators. *Nursing Education Perspectives*, *33*(4), 269–271.

Tallent-Runnels, M.K., Thomas, J.A., Lan, W.Y., Cooper, S., Ahern, T.C., Shaw, S.M. and Liu, X. (2006). Teaching Courses Online: A Review of the Research. *Review of Educational Research, 76(1)*, 93–135. https://www.learntechlib.org/p/70120/

Tennyson, R. D. (1989). *Cognitive Science and Instructional Technology: Improvements in Higher Order Thinking Strategies*. Proceedings of Association for Educational Communications and Technology.

Tomei, L. (2006). The impact of online teaching on faculty load: Computing the ideal class size for online courses. *Journal of Technology and Teacher Education*, *14*(3), 531–541.

Ward, E. C. and Lee, J. E. (1995). An instructor's guide to distance learning. *Training and Development*, *49*(11), 40–45.

Wiggins, G., Wiggins, G. P. and McTighe, J. (2005). *Understanding by design*. Ascd.

Wiggins, G. (2009). Understanding by Design. *Authentic Education*. www.authenticeducation.org.

Yin, R. K. (2014). Case Study Research: Design and Methods. *Utgave–SAGE Publications*.

Young, A. and Norgard, C. (2006). Assessing the quality of online courses from the students' perspective. *The Internet and Higher Education, 9(2)*, 107–115.

Authors

Teresa Avery is a PhD candidate in the Doctor of Philosophy, CSTD program at OISE. She is also pursuing the collaborative program with the Information School in Knowledge Media and Design. Teresa is interested in aspects of online discussion and collaboration which can incite critical thinking in online learning. Email: teresa.avery@mail.utoronto.ca

Dr. Alexandra Makos is a faculty member at OISE/UT. Her current research explores the role of how social presence is represented and enacted in online learning environments. The research is aimed to better understand how social affordances in

learning environments are purposefully mobilized through instructional design. Email: alexandra.makos@utoronto.ca

Wafa Sarguroh is an eLearning Specialist at the Ontario Institute for Studies in Education. She has a Bachelor's and Master's in Information Technology and also has experience teaching Masters in IT in India. Wafa completed her M.Ed in Curriculum and Pedagogy with special emphasis in digital technologies and education from OISE. Her research interest lies in the field of E learning and Educational Technology, particularly online collaborative learning environments and educational software that can make learning more meaningful and engaging for 21st century learners. Email: wafa.sarguroh@mail.utoronto.ca

Preeti Raman is a PhD student in the Curriculum Studies and Teacher Development program at the Ontario Institute for Studies in Education. She has an M.S. in Computer Science, an M.A in Curriculum and Pedagogy and teaches Data Science courses. She researches online learning communities, ethical AI and human-centered learning analytics. Email: preeti.raman@mail.utoronto.ca

Dr. Clare Brett is currently the Chair for Graduate Studies in the Department, and Associate Professor in the area of Education and Knowledge Technologies. She is also an Associate Member of Technology Enhanced Learning (TEL) centre at the University of Lancaster. Her research and teaching focus lies in the area of education and knowledge technologies. Email: clare.brett@utoronto.ca