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Using Online Lectures to Promote Engagement: Recognising the Self-Directed Learner as Critical for Practical Inquiry

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Abstract

This study analysed the relationships between teaching presence, social presence, and cognitive presence in online learning environments (Garrison, Anderson, & Archer, 2000), with an emphasis on examining ways in which the design of instructor presentation formats relates to student responses in discussion forums. Both quantitative and qualitative analyses were used to determine the nature of student responses, primarily through the lens of the Practical Inquiry Model (Garrison, 2007), by coding all text in the initial student responses to content-based questions. Twenty participants were randomly assigned to two sections in a graduate-level, teacher education course. One group was provided with metacognitive prompts throughout the asynchronous lecture presentation. They were asked to pause the presentation and document their thinking relative to the prompts. The other group was not asked to pause and write during the presentation, nor were there any metacognitive prompts embedded in their presentation. A Pearson's chi-square analysis was used to analyse the coding of the text, and a form of text analytics was used to seek out the nature of student learning and cognitive presence. There was no significant association found between the design of the instructor presentation and levels in the Practical Inquiry Model. Furthermore, the themes, number of total themes, and word count remained consistent between the two groups.

Keywords: online learning; student engagement; cognitive presence

Introduction

Alongside a rapid proliferation of online educational degree options for teacher-education programmes, there has been an increase in attention on the efficacy and effectiveness of such a methodology for preparing both pre-service teachers and those seeking to continue their education by earning advanced degrees (Saltmarsh & Sutherland-Smith, 2010). Focus on increasing the effectiveness of online programmes by improving student engagement in learning environments has been at the forefront of conversations (Pittaway & Moss, 2014). Degree programmes, either partially or fully online, are considered to be online when students engage in course options without needing to meet face to face to complete a course (Richardson & Swan, 2003).

Online learning, distance education, or the "flipped classroom" design (Herreid & Schiller, 2013) provide an advantageous avenue for pursuing post-bachelor degrees due to the methods of course content delivery and its ability to provide more equitable opportunities (Moore & Graham, 2003). Online learning has evolved in design and implementation (Lee, 2017). There have also been increased efforts to include opportunities for synchronous communication in a primarily online learning context (McBrien & Jones, 2009). With ever-increasing options for designs of

online programmes, it is essential to explore best practices for maximising the quality of student engagement and learning.

While online learning brings many advantages, there are also many design considerations to be made when creating an online learning environment, including the technologies to be used to ensure ease of participation and collaborative learning (Palloff & Pratt, 2003). Considerations include the audience, ways in which participants (including the instructor) will interact with each other, how participants will receive feedback, and whether the course is designed as fully online or blended (Shearer, R., in Moore & Graham, 2003). Shearer (2003) writes that although students choose to take online classes for the autonomy provided, it is also essential to ensure they complete the course successfully—given that they are often in an isolated learning environment. This dichotomy creates inherent challenges when creating optimal online experiences and recognising that the interactions between individuals in the online community are central to their learning (Beldarrain, 2006; Garrison & Cleveland-Innes, 2005). A focus on creating diverse student engagement strategies to maximise learning ought to be a central consideration when designing online learning experiences.

So far, research has focused on strategies for improving presence in the classroom through initial engagement strategies while recognising the diverse needs of the individual learner (Bonk & Zhang, 2006; Mandernach, 2009; Pi & Hong, 2016; Crook & Schofield, 2017). This current study focuses on recognising the difficulty in allowing for student autonomy and independence through flexible learning options, while ensuring a viable and consistent learner experience by analysing presence in a classroom. The author seeks to uncover the nuances of how to deepen cognitive presence by manipulating social and teaching presence through lecture presentation design. The findings compel online instructors to consider the needs of the self-directed learner by finding ways to make transformational design shifts that could lead to authentic deepening of student learning in a typically asynchronous learning. Furthermore, the results compel future researchers to explore whether it is possible to produce deep levels of cognitive presence in an online asynchronous course by manipulating design features of the learner's experience with strategies that increase student engagement.

Theoretical framework

Metacognition and adult learning theories

When we recognise the contributions from Knowles (1980) regarding theories of adult learning (andragogy), there are several considerations to be made when designing opportunities for engaged communities of learning. Knowles (p. 56) emphasises the importance of internal processes that motivate the learner for inquiry-based exploration that is relevant to their needs and context. However, as Brookfield (1986) writes, other variables contribute to the effectiveness of adult learning, including context, political atmosphere, and group dynamics, to name a few. These contribute to an overall climate of learning that ought to be considered in both traditional and online learning environments. Brookfield also cautions that the self-directed adult learner may require a level of scaffolding and involvement of other learners in developing metacognitive strategies. These types of engagement strategies include opportunities for learners to reflect on their individual learning needs, understanding how to carry out their plan for learning, and how to meet their learning objectives. Understanding the unique learning needs of adults better equips instructors to create effective learning opportunities that maximise metacognitive skills through reflection and collaborative engagement.

Engagement

Designing opportunities for maximised student engagement in online learning is an integral component of designing overall student learning experiences. Manderdach (2009) explains that the feelings of isolation in an online community may be more pronounced than in a face-to-face setting because students might be learning in physically isolated spaces. These spaces are not likely to have the features of a traditional classroom setting. This is an important consideration given the relationship between engagement and learning, and it is even more pronounced when measured through the lens of the three interdependent components of online presence.

In the context of online learning, the success of students meeting the learning goals rests on their willingness to be active participants of the content presented in the course and to engage in monitoring their own learning process (Bomia, Beluzo, Demeester, Elander, Johnson, & Sheldon, 1997, p. 294). In a general description of the process of active learning in the online environment, Bonk and Zhang (2006) provide a framework of R2D2: read, reflect, display and do. Here they describe the learner's engagement with the content presented in a variety of modalities. Reading, exploring other resources and listening to lectures, video presentations, and/or podcasts occurs during the read phase. The second phase specifically attends to the needs of a variety of learning preferences through multi-modal methods. It provides opportunities for the learner to reflect on their learning. Consideration should therefore be made for instructor roles – along with lesson design and peer interaction—to maximise student engagement in both a traditional classroom setting and in the context of online learning. Bonk and Zhang (2006) add that one way to do this is by providing opportunities for collaborative, written dialogue in discussion forums.

Paying particular attention to the ways in which online course designers use presentation modalities to maximise student engagement and presence is especially relevant to this study. There has been little research on specific ways in which instructors can use video to increase social presence (Borup, West, & Graham, 2012). Crook & Schofield (2017) describe the purposes of the lecture presentation in an online learning setting and explain that the learner's sense of agency is a critical consideration for increasing participation. They connect this with how students make meaning through their experiences. Homer, Plass, & Blake (2008) found that learners' feelings of engagement differed, depending on whether video was included in the PowerPoint presentation they viewed. More relevant to this discussion was the finding that individual preferences affect the learning experiences of the students, perhaps even more than the design of the presentation itself. The authors make a compelling argument for course designers considering learner preferences when creating presentations and other content to meet the needs of the individual learner experience. Manderdach (2009) conducted a study exploring changes in student engagement when instructor-personalised multimedia supplements were included in online courses. The comparison group in Manderdach's study was an online course without instructor-personalised media (such as narrated PowerPoints and videos). Student engagement questionnaires, cumulative final exams, and grades were used as outcome measures for both groups. Manderdach conducted a one-way analysis of variance (ANOVA) that showed no significant group differences relative to the engagement survey or learning (outcomes). Open-ended responses on the engagement survey indicated students were engaged with the instructor-personalised media. Manderdach (2009) notes that there were discrepancies in the quantitative and qualitative findings and these differences should be further explored. These discrepancies include results that show students in the group with instructor-personalised multimedia supplements feel more engaged in their environment, but the quantitative measures lack evidence to support this. These findings emphasise the need to deepen the body of research that focuses on discerning transformational pedagogical changes that could lead to significant group differences in both student learning and levels of student engagement.

Specific organisational structures and considerations for creating a quality online learning environment are critical for achieving high levels of engagement (Richardson & Swan, 2003) and ensuring that course participants receive a quality experience. The Community of Inquiry (CoI) Framework for measuring engagement in an online learning environment includes three aspects of "presence": social presence, cognitive presence, and teaching presence (Garrison, Anderson, & Archer, 2000). According to Garrison et al. (2000), social presence includes designing opportunities for students to interact with each other and considers ways in which students can express themselves with their peers in a safe environment. Teaching presence focuses on the learner's quality of experience as a result of the teacher creating opportunities for engaging students through a variety of instructional methods. Teaching presence considers not only how the course is organised to promote quality engagement, but also how the teacher interacts with their students to influence levels of interaction and learning. Sustained teaching presence is controlled most directly by the course instructor (Anderson, Rourke, Garrison, & Archer, 2001). Cognitive presence focuses on opportunities for students to engage with the academic content. It includes students' abilities to adapt new knowledge to previous understanding and to connect and apply new information.

Bloom's Taxonomy of Learning (Forehand, 2005) takes into account the progressions by which a learner engages with and processes new information through a variety of learning experiences. Generally speaking, there are levels of learning that progress (not necessarily in order) from lower levels of learning, such as knowledge and understanding, to higher levels of learning, such as evaluation and synthesis. Bloom's Taxonomy has also been divided into three main domains: cognitive, affective, and psychomotor. While it's certainly not a direct parallel, the concept of cognitive presence in the CoI Framework reflects this hierarchy of learning by using the Practical Inquiry Model (Akyol & Garrison, 2011), in which students progress through stages of learning—from asking questions and creating a sense of wonderment, to applying and integrating this new knowledge in different ways. One difference between Bloom's Taxonomy and the CoI Framework is the need to recognise that the CoI Framework takes into account the experience of learning as created by teaching presence and social presence. The three components of the CoI Framework are interdependent, while Bloom's Taxonomy focuses solely on the learner and their progression of learning. According to Kanuka & Garrison (2004), students' experiences with levels of cognitive presence contribute to their success in achieving higher-level learning experiences.

Understanding the interdependence between social, teaching, and cognitive presence is critical (Berge, 1995; Anderson et al., 2001; Garrison et al., 2001). Shea and Bidjerano, (2008) write, "[t]he community of inquiry framework (CoI) focuses on the intentional development of an online learning community with an emphasis on the processes of instructional conversations that are likely to lead to epistemic engagement" (p. 544). This paper focuses primarily on students' movement through the levels of cognitive presence by intentionally guiding the ways teaching presence and social presence are provided to students. Four levels of cognitive presence can be measured with a specified set of descriptors. Akyol and Garrison (2011) describe a Triggering Event, in which students recognise a problem and display a sense of questioning, puzzlement, or wonderment. In Exploration, students exchange information with one another, suggesting new ideas, brainstorming, and making other intuitive leaps. In the third stage, Integration, students synthesise their ideas and (possibly) provide solutions. Finally, in the Resolution stage, students apply and test their ideas, and defend their solutions.

This study builds on previous work of seeking to understand the instructor's role in influencing the depth of cognitive presence in online learning environments. This investigation uses the Practical Inquiry Model's Four Stages of Cognitive presence: Triggering Event, Exploration, Integration, and Resolution (Garrison, 2007), to better understand how students can interact with instructor information and how it might affect their depth of knowledge and learning process as

demonstrated in a discussion forum. The investigator sought to explore whether, by scaffolding the meta-reflective process during an initial lecture presentation that has opportunities for dialogue, it would be possible to engage students in the early stages of the Practical Inquiry process before moving into more formal discussions and collaboration with peers in a discussion forum. This descriptive, mixed-methods study explores the relationships that teaching presence and social presence could have with cognitive presence, as documented by student written responses in discussion forums. The researcher was interested in determining whether participants' asynchronous dialogue while viewing a lecture presentation (similar to that of synchronous dialogue during a lecture) would have any effect on later discussions—in comparison with a group that did not have any opportunity for dialogue during a lecture presentation.

Methodology

While we recognise the interdependence between cognitive, social, and teaching presence, we also need to investigate how an online course instructor's course design and implementation influences the level of student engagement. Any online learning structure should have many opportunities for students to maximise their engagement and learning. This interplay may be evident through learning opportunities such as presentations, group work, discussion forums, and other collaborative assignments. For this study, one initial method of content delivery was through screencast presentations, during which students engaged in learning content-specific information as presented by the course instructor. Using the CoI Framework, and specifically focusing on cognitive presence, the researcher sought to explore how the design and implementation of screencast presentations influences how students responded to initial discussion forum prompts. This quantitative study used mixed forms of data using qualitative data analysis (QDA), regression analysis, and text analytics. QDA was used to code text for stages of cognitive presence by coding student text in their initial discussion forum responses. A Pearson's chi-square analysis was then used to determine any statistically significant associations between the type of lecture presentation and student responses. Further data analyses were conducted through a form of text analytics to determine common themes and facets.

Research questions

1. Are there statistically significant associations between the type of lecture presentation and the depth of cognitive presence within the initial discussion forum?
2. What levels of cognitive presence are evident in discussion forums in response to scaffolded reflective prompts during prerequisite online presentations compared to those without scaffolding?
3. Were there other differences in regards to themes, document sentiment and word count between the two groups?

Participants

All 20 participants in this study were enrolled in a fully online course. There were 12 female and 8 male participants. All participants were current teachers with a range of 2–15 years of teaching experience. The participants were enrolled in a Master of Education Graduate programme. The courses in this 2-year programme were either completely online or blended. All students had previous experience with both models. Institutional Review Board approval was granted on March 1, 2017, approximately 3 months before the course was launched.

Design

All 20 participants were randomly assigned to one of two sections of the same course through an online programme that assigns groups; that is, the researcher entered all names into a programme called "Random Team Generator" (www.randomlists.com) to create two groups. Both groups were asked to watch an initial lecture presentation before responding to one or two questions in their respective discussion forums. The videos were embedded (linked) in their discussion forum. The videos, which were 6–23 minutes long, included information pertinent for the topic and goals for the week. There were five presentations (5 weeks) included as the focus for this study.

The instructor used two approaches to scaffold student thinking and engagement in the lectures.

Group One had reflective (metacognitive) questions interspersed throughout the five lecture presentations. These "engagement pauses" aligned with the levels of Bloom's Revised Taxonomy of Learning (Krathwohl, 2002) to ensure that the questions asked in the lecture presentation provided the participants with opportunities to engage in thinking aligned to Bloom's Revised Taxonomy levels: apply, analyse, and evaluate. The prompts were intentionally placed in the presentations to elicit the participants; thinking about how the content applies to their own instructional practice, how it might or might not align with their current thinking, and how it could be modified to meet their classroom context. This group's lectures were all viewed in Vialogues, a tool into which lecture presentations and other videos can be uploaded, and participants can watch and comment in a running dialogue box in real time. The participants in Group One were prompted to pause the presentation, and to respond to reflective prompts posed on the vialogue during the presentation. For example, as a viewer, they would watch the presentation, be asked a question (engagement pause), and then be prompted to stop the presentation and type their response in the Vialogue dialogue window. They could also read and reply to previous comments left by their peers in response to the same questions in the presentation. The participants then continued viewing the presentation. This pause, reflect, and write (engagement pause) process was repeated three to five times throughout each of the five presentations.

Group Two listened to the same lecture presentation but the lecture was recorded without engagement pauses or prompts to stop and write. Their lecture presentations were viewed through a link to a Zoom mp4 file and not held in any other application. After viewing the lecture, participants in both groups responded to one or two questions in their respective discussion forums. These questions were the same for both groups and were aligned with the learning goals and content in the lecture presentations. They were generally application-type questions, in which participants were asked to reflect on their current teaching context and apply the learning to their own practice and experiences.

The analysis comprised two steps. First, an initial coding of all text in the discussion forum was conducted; then, using the results of the coded text, a Pearson's chi-square was used to determine whether there were significant associations between the design of the instructor presentation (whether it was integrated with engagement pauses or not) and themes (stages of cognitive presence) in the student discussions. A content analysis was conducted by coding text from the initial discussion prompt responses using the Practical Inquiry Model's four stages of cognitive presence. The researcher copied and pasted all of the text from the 5 weeks of discussion, for all participants, in both groups, into two separate spreadsheets. One spreadsheet contained columns of text for each of the 5 weeks for Group One. Another spreadsheet contained columns of text for each of the 5 weeks for Group Two. These columns were labelled with the group and week number to identify the group's discussion after the coding was complete. The researcher then took the text from each week and from both groups, and copied it all onto a third spreadsheet that did not identify groups or weeks. This resulted in a third spreadsheet with ten columns of text but

no identifying labels. The researcher therefore could not identify which group the text came from, or the questions asked in that particular week.

Coding (using a Pearson's chi-square analysis) was used to determine any differences between the groups in terms of depth of learning. The coded categories of cognitive presence as described by Kanuka & Garrison (2004) include: (1) Triggering Event – where students exhibit a sense of puzzlement; (2) Exploration – where students search for information to make better sense of the problem (this includes exchanging ideas with peers); (3) Integration – where students assimilate new information in their pre-existing schema to make sense of the new information; (4) Resolution – where students apply and test their new knowledge and/or solve their problems. All applicable statements, phrases and/or sentences were coded with one of these four levels of the Practical Inquiry Model. As the researcher read through each sentence pulled from the discussion forums, they coded it with a relevant theme from one of the four categories (see Table 1).

Table 1 Samples of text aligned with each level of cognitive presence

Levels of cognitive presence	Example
Triggering Event	"Something I would like to learn more about is diversity in how I collect information from my students. I have been stuck in a system that is driven by fully guided instruction and would like to know how this looks . . . in an inquiry-based learning environment."
Exploration	"I appreciated the examples provided in the chapter. The grading scheme presented in this chapter for the science class, which was based on the collection of student evidence of each standard and then an opportunity to match a performance on an end assessment . . . This really interested me as it provided a feedback loop that moved learning forward, was evidence based on performance, effort, and knowledge but it also felt like a manageable method that could be implemented for most subjects and ages in some format."
Exploration	[Participants gave examples that referred to readings, presentation and/or sharing ideas about classroom practice]
Integration	"It was really eye-opening for me to read that 'from literally thousands of research studies, self-reports are unreliable" (Anonymous, p. 88). This makes sense because there is really no accountability and students can change their answers based on [those of] their peers. Therefore, recently I borrowed some mini whiteboards from a colleague and engaged students in articulating their thinking in a more challenging way."
Resolution	"I have found that classroom behavior and clarity from students has improved since I began displaying rubrics in my openings."

Phrases or sentences in the ten columns of text were identified and coded (highlighted) with one of four colours, depending on the level of cognitive presence shown.

The researcher was interested in determining the total number of incidents of each stage of cognitive presence in the discussions in each group. They also compared the groups to determine

how student thinking is scaffolded during the presentations that may be demonstrated in the text of their discussions later in the week.

The researcher also wanted to answer the question of whether the nature of the discussions varied based on the students' initial presentation of information and collaboration in the vialogues. As a second qualitative component of this study, a form of text analytics (Semantria [www.lexalytics.com]) was applied to explore semantic linguistic algorithms in the text. (Semantria is an Excel add-on.) An application programming interface (API) is used to submit the text to Semantria for analysis. All text was analysed for the following linguistic components:

1. Response sentiments (positive, negative, neutral)
2. Themes in the text (nouns and phrases that are relevant to the research), including total number of generated phrases.

Semantria searches text that is entered into Excel—in this case, all of the text pulled from the discussion forums for all 5 weeks for both groups. The program then identifies positive, negative, and neutral tones from the text and uses sentiment scores to assign a response sentiment to each theme, entity, and category extracted. This program also extracts themes from the text (including meaningful phrases pulled from sentences) to determine the nature of the dialogue within and between the groups. The program then categorises the themes into topics, based on the context from sentences and phrases.

Results

A Pearson's chi-square analysis was run to determine whether there was a significant association between the design of the instructor's presentation and themes in student discussions. According to Field (2009), Pearson's chi-square test is appropriate for determining whether there is a relationship between two or more sets of categorical variables. Because the researcher compared the frequency of each of the stages of cognitive presence found by coding the text, a Pearson's chi-square analysis is suitable. A non-significant association was found between the type of instructor presentation and how the students responded in the discussion forum based on stages of cognitive presence found in the text. (See Table 2).

The Pearson's chi-square test displays percentages across categories and across groups. The table shows the number of cases in each category (i.e., stages of cognitive presence *within* each of the groups (group with engagement pauses and group with no engagement pauses). It also contains the number of total cases in each category to compare the cases *between* the two groups. For example, in the first row (the No Engagement Pauses During Lecture group, or Group Two), the columns display each of the counts and the total count for each of the four stages of cognitive presence found in that group. Additionally, in the first column (Triggering Event) the rows display each of the counts and the total count of the two groups. The table also displays Counts and Expected Counts. The Expected Counts indicate the number of cases that would be categorised in each of the stages if left to chance, compared with the actual count based on the coding (Field, 2009). The values in the Count and Expected Counts are quite similar, indicating that there might not be a statistically significant association.

The percentages (adding up to 100%) are also displayed in two categories: *% within lecture type* and *% within student response*. For example, across the first row of No Engagement Pauses During Lecture, the *% within lecture type* for all four categories of cognitive presence gives a total of 100%. This shows how the frequency of the four stages of cognitive presence was divided up as a percentage *within* each group. Another way to display the percentage is to look at how each of the four stages of cognitive presence were divided up *between* the two groups. For example, looking vertically in the Triggering Event column, the two figures in the *% within*

student response categories add up to 100% because it shows the percentages of the two groups (lecture types).

A total of 312 coded phrases were analysed for both groups. Overall, the highest theme of 40.1% of the student discussions was classified under the theme of Exploration. The theme of Resolution had the lowest overall total of 4.5%. This is also consistent in both groups. There were more coded phrases in Group One, resulting in more occurrences in each of the levels of the CoI framework (176, compared with 136 for Group Two). Both groups had the greatest number of responses in the Exploration category, followed by Triggering Event, Integration, and Resolution. However, Group Two had more instances of participants' responses categorised at the level of Resolution than Group One.

Some assumptions need to be met when using Pearson's chi-square. The first is independence of data—this assumption has been met because this is not a repeated-measure design. The second assumption is that the expected frequencies should be greater than five (Field, 2009) and this assumption has also been met.

There was a non-significant association between the type of lecture presentation and the way in which students responded in the discussion X^2 (3, N = 312) = 2.569, p = .47. This seems to indicate that the type of lecture presentation did not have a significant effect on how the students responded in their discussion forum. The SPSS output also indicates that no cells have an expected count of fewer than five, which means that the chi-square statistic should be accurate (Field, 2009).

Table 2 Participant responses for each lecture type

			Student Response				
			Triggering Event	Exploration	Integration	Resolution	Total
Lecture Type	No Engagement Pauses During Lecture	Count	48	53	26	9	136
		Expected Count	49.3	54.5	26.2	6.1	136.0
		% within Lecture Type	35.3%	39.0%	19.1%	6.6%	100.0%
		% within Student Response	42.5%	42.4%	43.3%	64.3%	43.6%
		% of Total	15.4%	17.0%	8.3%	2.9%	43.6%
	Engagement Pauses During Lecture	Count	65	72	34	5	176
		Expected Count	63.7	70.5	33.8	7.9	176.0
		% within Lecture Type	36.9%	40.9%	19.3%	2.8%	100.0%
		% within Student Response	57.5%	57.6%	56.7%	35.7%	56.4%
		% of Total	20.8%	23.1%	10.9%	1.6%	56.4%
	Total	Count	113	125	60	14	312
		Expected Count	113.0	125.0	60.0	14.0	312.0
		% within Lecture Type	36.2%	40.1%	19.2%	4.5%	100.0%
		% within Student Response	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	36.2%	40.1%	19.2%	4.5%	100.0%

Because the researcher was interested in gaining a better understanding of the nature of the discussions, another component of this study involved analysing themes and text sentiment. The text analytics software, Semantria, was used to extract themes in both groups. Themes were

generated by extracting context and meaning from the entities. The underlying intentions of the text were also considered (www.lexalytics.com). Any plural forms of the themes were combined. For example, *formative assessment* was combined with *formative assessments*, and *learning target* with *learning targets*. Sixty-eight themes were extracted from Group Two, and 82 themes were extracted from Group One. For example, the theme *formative assessment* occurred 13 times in Group Two. Of those 13 times, none of those occurrences was expressed in a negative way, 5 occurrences were expressed in a neutral way, and 8 were expressed in a positive way. In Group One, the theme *formative assessment* occurred 20 times. Of those 20 times, none was expressed in a negative way, 8 were expressed in a neutral way, and 12 were expressed in a positive way. Table 3 shows the breakdown of themes and sentiments for Group Two. Table 4 shows the themes and sentiments of Group One. *Learning expectations* and *formative assessment* were in the top five for both groups. Note that some of the themes appear to be very similar (e.g., *learning expectations* and *learning targets*). But because Semantria uses context to create the distinct themes, caution is advised when assuming that these terms are synonymous. The program does not necessarily define the themes; it simply differentiates them. For example, while some might use the two terms synonymously*, learning target* could refer to a very specific technique for communicating a general *learning expectation*. On the other hand, both groups wrote about using *exit tickets*, but one group used the term *exit slip*. These two terms probably refer to the same strategy, but the groups could use different vocabulary based on that of the first participant in the forum. Overall, both groups showed similar themes and sentiments; however, although the questions were similar across both groups, the content of their responses varied.

Finally, the researcher was interested in understanding whether students tended to write more or less, given opportunities (or lack thereof) for documenting their initial thinking in their assigned mode of lecture presentation. For example, were the students who were asked to write initially in the vialogue already fatigued with writing? If so, they might not have been as willing to write as much in their discussion forum as those in the group who were not asked to write their initial thoughts. Group Two wrote 16,608 words in the initial discussion prompts over the 5 weeks, and Group One wrote 16,563 words. Although Group One did, in fact, write less than Group Two, the difference is slight.

Table 3 Themes and sentiments for Group Two

Theme	Negative	Neutral	Positive	Grand Total
learning expectations	1	4	5	10
learning target	0	2	5	7
exit tickets	0	2	5	7
formative assessment	0	5	8	13
success criteria	0	0	5	5
feedback	0	5	0	5
constructive feedback	0	3	2	5
school-wide culture	0	2	2	4
whole class	0	3	1	4
special needs	0	0	4	4
giving feedback	1	1	2	4
Grand Total	**2**	**27**	**39**	**68**

Table 4 Themes and sentiments for Group One

Theme	Negative	Neutral	Positive	Grand Total
formative assessment	0	8	12	20
next steps	0	4	4	8
learning expectations	1	5	2	8
cause thinking	0	3	3	6
learning target	2	4	3	10
school-wide culture	0	1	4	5
giving feedback	0	3	2	5
school year	0	4	0	4
action plan	0	3	1	4
exit slips	1	1	2	4
professional development	0	0	4	4
providing feedback	0	3	1	4
Grand Total	**4**	**39**	**38**	**82**

Discussion

Given the rapid increase in the availability of online learning, it is critical to consider ways to increase social presence through participation and collaboration amongst participants (Palloff & Pratt, 2003), while also acknowledging the effect of student self-directed learning on active participation (Bomia et al., 1997). As Homer, Plass, and Blake (2008) also write, further consideration needs to be given to creating opportunities for the learner to choose the learning modality that best meets their individual needs. Perhaps the scaffolding of the questions that were intended to create opportunities for deeper reflection of the topics actually limited the metacognitive process for some learners. Both groups, whether provided with a more engaged approach to listening to the lecture or not, responded similarly in content discussed, word count, and themes. There were no statistically significant differences between groups with regard to how they progressed through the stages of cognitive presence as outlined in the Practical Inquiry Model, although there were more instances of Resolution in Group Two. This suggests that participants' initial discussion forum responses did not necessarily differ based on the type of lecture presentation. While not statistically significant, the participants in Group Two showed more instances of demonstrating the Resolution phase than those in Group One. Multifaceted methods for participant engagement in an online lecture presentation may therefore need to be not only transformational, but differentiated, to affect the stages of cognitive presence in other aspects of the course. This finding reinforces the need to consider the needs of the self-directed learner by creating multiple methods of engagement in an online presentation or other modality.

As other researchers (Garrison & Cleveland-Innes, 2005) found, the quality of teaching and social presence does have an effect on cognitive presence. As echoed by Manderdach (2009), the change resulting from manipulating lecture presentations might not have been transformational enough to lead to any lasting learning differences; nor did it take into account the role of the "active" learner in assimilating their previous experience with the new information. Another conclusion is that, since both groups were given the same prompts to answer in the discussion forum, any initial progression through the Practical Inquiry Model while engaging in the initial lecture presentation was eliminated when confronted with new information (or, in this case, scaffolding by the questions). As Palloff and Pratt (2003) write, instructors can facilitate (not teach) within a learner-focused online environment. Group One listened and interacted with their lecture and peers in the vialogues, then moved to their learning management system (LMS) to answer the initial discussion questions and continue their written conversations in a self-directed way. This change in context could have hindered the continuation of learning and perhaps delayed progression through the levels of cognitive presence.

After combining plural forms of the same theme, text analytics further confirmed the similarities in themes and theme sentiment across both groups. The assumption was that, because the presentations in Group One were scaffolded, there would be fewer themes overall. This was not

the case. The scaffolding and opportunities for students to reflect on their learning while participating in viewing the lecture yielded no relationship with the topics discussed in the forum. There was a slight difference in the total word count (as shown above, Group Two discussions had 16,608 words; Group One discussions had 16,563 words). This finding is not surprising given the assumption that participants had already written their initial thoughts in the vialogue forum and might not have wanted to repeat themselves in their initial response in the discussion forum. Perhaps they experienced fatigue from already providing written dialogue, and were therefore not as motivated to respond in depth again. However, given this variation in total word count, the differences were minimal.

Several limitations in this study may have affected its internal and external validity. Instrumentation is one type of extraneous variable that could have influenced the outcome of the coding totals (Gall, Gall, & Borg, 2007). Differential selection could also have been a factor, in that all of the participants have had significant previous experience—not only with one another, but with other instructors.

It is also important to discuss the external validity of this experiment. Because this was a discrete group, it is difficult to generalise the findings of this study to a larger population. These educators are learning within a graduate-degree programme and already have considerable experience with online learning. The results might have been different if this had been a first online class, or if the participants had not already had a great deal of knowledge, skills, and experience in the content. However, although there is some potential to generalise to a target population in a similar situation and demographic, caution is encouraged (Gall et al., 2007).

Finally, it is important to note that this design measured associations, not cause and effect. Although it might be tempting to conclude that the type of lecture presentation affected how students responded in the discussion forums, only relational observations should be made.

Practical implications

These findings illustrate the complex nature of using strategies related to teaching and social presence to improve student engagement that leads to deeper learning. The study also demonstrates and emphasises the importance of considering not only the types of strategies that instructors use to increase student engagement, but the quality of those activities. Adding opportunities for students to engage in metacognitive practices using a more traditional, one-way approach to improving instructor presence might not be sufficiently transformational to deepen students' cognitive presence. It certainly does not take into account the self-directed nature of the adult learner and their ability to choose how they make meaning from the content they experience, regardless of the design. It would also be interesting to note any associations or differences in the depth of learning if the discussion had continued in the vialogue rather than asking the participants to continue the discussion in their LMS. This would have allowed the students to engage in the content based on their own reflective practice, conclusions, and questions, rather than scaffolding their learning within prefabricated questions.

Online learners are critical thinkers who ought to take charge of their learning and take ownership of their own quality of experience and depth of learning (Palloff & Pratt, 2003). The facilitator of an online course should develop it with this in mind rather than simply replicating a face-to-face course. Having said that, this course was not a simple replication of a face-to-face course. The instructor sought to engage the learners in effective pedagogy for online learning (it is imperative that instructors engage their students in deep learning, and opportunities for quality interactions with both their peers and with the instructor). However, the most important strategy is to recognise adults as self-directed learners and create opportunities for them to choose how they will engage in their learning through multiple modalities. Strategies for increasing student

engagement in online learning environments is complicated and multi-faceted. Modifying and/or scaffolding initial ways to engage in online learning might not be enough to negate the effect that the learner has on their own experience.

Conclusions

In higher education, is essential for online instructors to understand how to facilitate a learner-centred online environment that increases engagement and cognitive presence by aligning practice with the theories of adult learning (androgogy). Mezirow (1997) explains that, for the adult learner, new information is only a resource that is incorporated into their existing frame of reference. Their learning may also be affected by their prior experience and through learner-centred dialogue and problem-solving with others. Recognition of these interrelationships and the increased promotion of online learning is the first step; further investigation into the strategies for ensuring maximal levels of learning for adults is overdue. There is also a need for further investigation into the interplay between the self-directed nature of online learners and stages of cognitive presence that may change according to different learners' experiences. Haythornthwaite (2006) also recognises the influence that an online community of learners has on knowledge construction. This study underlines connections between course design and androgogy; the dialogue and collaboration in a discussion forum, led by the self-directed learner, will be more influential than any single method for increasing engagement through a lecture presentation. This further confirms conclusions made by Palloff and Pratt (2003), who indicate it takes more than simply modifying and/or scaffolding ways in which participants learn new information to improve the depth of their learning. Rather, the continuum of experiences created by the facilitator, the students, and the design of the course ought to be major considerations and recognised as interconnected. Perhaps the conclusions by Pittaway and Moss (2014) encapsulate the essence of how to create opportunities for deep learning when they emphasise the need for nurturing an online community of learners. Building on previous research findings—specifically Garrison and Cleveland-Innes (2005)—this study confirms the importance of understanding the qualitative nature of student experiences that lead to a deeper level of cognitive presence. Transformational shifts in how instructors approach presence in their online classrooms needs to continue to be developed, specifically in relation to differentiating options for ways in which the learner engages with the content. Simply shifting, supplementing, or augmenting instructor strategies to increase both teaching and social presence is not enough. It's essential to focus on the learner-centred nature of student engagement that considers a collaborative approach to online learning. While the results of this study add to the current foundation of research on designing online experiences for the self-directed nature of the adult learner, it is also a call to action for any online course designer to recognise the integral interplay between the power of self-directed learning and the opportunities for collaboration needed for authentic online learning.

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