

# How to create meaningful learning experiences in an online environment: components from coding student reflections

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## Abstract

*This paper examines the learning experiences using student reflections. Data collection was carried out by prompting undergraduate students to reflect on their worst and best experiences, accomplishments, and what they learned through online collaborative activities. The theoretical framework used to explore these experiences was the Community of Inquiry model, which claims the optimal learning experience is at the intersection of three presences (Garrison, Anderson, and Archer, 2000). How can we use these student perceptions of their experiences to create optimal learning experiences in an online environment? Specific teacher characteristics, sense of community, learner effort, sense of improvement and progress, student expectations of online classes, and the impact of feelings and emotion on other presences are some of the themes that surfaced through content qualitative analysis in this study. Students also responded to a validated survey (explicitly prompting the CoI presences) which revealed the impact of lack of student interest in course topics. These themes are valuable because they reveal significant components of students' learning experiences which can be used to recreate optimal experiences in other settings. This paper builds on the theoretical framework by adding the student perspective and offering a codebook for qualitative content analysis of reflections.*

**Keywords:** *Optimal learning experiences; Student reflection; Community of Inquiry; Qualitative content analysis*

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## 1. Introduction

The Community of Inquiry framework (Garrison, Anderson & Archer, 2000) depicts how the optimal student learning experience occurs at the intersection of three interdependently functioning presences. Creating and sustaining a collaborative learning community requires an understanding of the dynamics among and within the three presences (Akyol & Garrison, 2008): social presence, cognitive presence, and teaching presence. As one of the leading models guiding research in the field of online higher education pedagogy (Garrison and Arbaugh, 2007), it has become increasingly popular as a tool for conceptualizing the online learning process (Arnold & Ducate, 2006; Shea, 2007; Stodel, Thompson, & MacDonald, 2006; as cited in Garrison & Arbaugh, 2007, p.158).

Behind the seminal article of this framework, which according to Google Scholar has been cited 4,618 times (as of July 2018), lies the context of online learning which took place about 20 years ago. The context and design of the course are directly linked to what researchers focus their study, the type, and modality of students' demonstration of learning. Traditionally, online classes included instructors posting videos, students completing certain readings, then having a text-based discussion of knowledge application and construction, and (possibly) culminating with a final project or paper. This was most probably the context of online learning during the development of the CoI framework; therefore, discussion boards were studied by researchers to develop theories of online learning. However, the CoI framework is about learning experiences in general, and is not limited to discussion board experiences.

Today's learning environments are changing and "becoming more community-driven, interdisciplinary, and supported by technologies that engage virtual communication and collaboration" (Johnson, Levine, Smith, & Smythe, 2009, p.6). These new spaces of learning, the conceptual and practical issues, and the quality of the learning students experience in these spaces need to be understood using a theoretical framework that helps shed light on the complexities of online learning to analyse this virtual learning space along with the interactions and outcomes related to them (Shea & Bidjerano, 2008). As online course design has evolved, so should the focus of research, the modality of student learning demonstration. This paper looks at student reflections to better understand online learning experiences and to add to the body of CoI theoretical framework created using discussions. This research brings to light the need to critically examine the theoretical framework and calibrate it alongside the ever-changing technological advances in course design and the learning culture.

The quantitative analysis of the survey, the direct product of the original CoI framework, did not allow me to gain a deep understanding of the students' teaching, social, and cognitive presences. To do so, I turned to student reflections as a window into their individualized stories and learning experiences. In this study, student reflections were analysed to obtain contextual evidence to build an accurate picture of student learning experiences. Unfortunately, however, at that time, no previous studies had reported on any reflections done by students and there were no studies directly having coded student reflections based on the CoI framework. This paper addresses the methodological gap in the research by discussing the process of qualitative content analysis of reflections based on the CoI, and presenting the final codebook.

In this research, the following research questions were addressed: 1. What are students' perceptions of meaningful or optimal learning experiences in an online environment? 2. How are their general and online learning experiences represented in written reflections related to the presences categorized by the CoI framework?

## **2. Methodology**

Through purposeful sampling, 34 undergraduate students of a Midwestern university were selected for this study. They were enrolled in a one credit hour online course titled "Technology for Educators". All data collection was in accordance with IRB guidelines and took place during the Fall 2014 and Spring 2015 semesters.

I utilized the Community of Inquiry model (Garrison, Anderson, and Archer, 2000) to explore these students' learning experiences. The framework claims the optimal learning experience is the function of three presences: teaching, social, and cognitive presences. I explored the students' explicitly prompted perceptions (using quantitative analysis) and implicitly prompted written reflections (using qualitative analysis) of their learning experiences in this study.

To address the quantitative section of the study, students were asked to fill out a 35-item survey about their perceptions of their learning experiences based on the three elements of the Community of Inquiry. Through factor analyses in multiple contexts, the survey has proven to be a valid and efficient measurement of the three-factor structure of the presences in the Community of Inquiry framework (Arbaugh et al., 2008; Kozan & Richardson, 2014; Swan et al., 2008). Students were also asked to rate their overall satisfaction with the online course. Responses on a Likert scale ranging from "Strongly Disagree" to "Strongly Agree" were collected anonymously. Even though Sauro (2011) mentions that when items are summed, averaged, or combined, including a neutral response might not have a great impact on the scores, the neutral response was excluded from the survey to urge participants to make a decision about whether they actually agree or disagree with an item. For the results of a four-point scale to be comparable with the results of other studies on the original five-point scale, the perceived presences are reported in percentages as well. The purpose of administering this survey was to help gain a quantitative measure of the degree of perceived presence in each of the classes to better understand the context of the classes.

For the qualitative section of the research, three main datasets of student reflections were analysed. Students were asked to reflect on their learning experiences by responding (in writing) to these prompts:

- Describe your best and worst class experience you have had.
- Why do you deserve an "A"?
- What did you learn about yourself through the team collaboration process? How did this activity contribute to your learning?

The course chosen for this study is unique because it is a competency-based course in which undergraduate students need to demonstrate mastery of certain skills. Students need to show their capabilities and share specific deliverables with the class. In response to Prensky's (2010) call to educational institutions at all levels to integrate more recent technologies, such as visually rich and interactive media into instruction to engage students in the learning process, the course has video conferencing elements in addition to the traditional text-based platform. As part of the course goals to expose students to a variety of educational technology tools, a combination of synchronous and asynchronous tech tools is used for students to complete individual as well as collaborative course activities.

As part of the pedagogical design of the online course, students were asked to reflect on their learning experiences. These reflections helped students identify and express self-change and their accomplishments, understand their progress not otherwise visible through assignment completion, and make personal learning connections with course activities. Having students reflect gave them the voice and agency expected of them throughout the course.

To analyse these reflections, I chose the qualitative content analysis approach. I did two rounds of open and axial coding: data driven and theory driven. I open coded inductively, letting the student reflections guide me. I axial coded and identified relationships between the codes and connected them, which led to developing and deleting some codes. In the second round of coding, I used the conceptual framework of the Community of Inquiry model (Garrison, Anderson & Archer, 2000) as my guide to code the reflections. This model of online learning accounted for the elements necessary for optimal learning experiences. Without intentions to prove or disprove the theory, I wanted to analyse the data through this theoretical perspective.

The qualitative content analysis method supports the combination of inductive and deductive approaches I used to develop initial codes. Considering literature on student perspective of online learning experiences is limited, the inductive approach was appropriate (Elo & Kyngäs, 2008). With the goal of aligning the student learning experiences

with the existing theory of CoI, the deductive approach was appropriate as well (Cho & Lee, 2014). Using both the approaches, the categories developed and selected were data driven as well as theory driven.

In this data analysis, theories of the Community of Inquiry helped conceptualize and form the initial codes and relationships between codes. All the preset indicators related to the CoI model from the literature were designed to be used for coding student discussions, and were not applicable to student reflections. For example, “continuing a thread” or “asking questions” are suitable indicators of social presence when looking within discussions, but are irrelevant within the context of reflections. Key concepts of each of the presences were pulled out and used as guidelines to identify instances of each of the presences in the data, and deductively conducted open coding and axial coding.

Hierarchical axial coding was done using the original three categories of the CoI theory: teaching, social, and cognitive presences. Shuffling the codes under the existing subcategories led me to realize the need to utilize both data-driven and theory-driven codes as some codes had no place. I compared the stratified codes from both rounds of coding and connected them by overlapping what was possible. I added a fourth category to the Teaching-Social-Cognitive Presence triad. To avoid confusion with Learning Presence defined by other researchers (Shea & Bidjerano, 2010; Shea, Hayes, Smith, Vickers, Bidjerano, Pickett, & Jian, 2012), I labelled the extra category “Learner Effort” and moved some of the codes under this umbrella term.

The final step of analysis was having an outsider to the project, a qualitative research methods professor, code the data using the codebook I developed. She independently coded the data and I cross-checked our analyses. Almost a complete alignment existed between our coding, with the exception that she had not used two codes, as their meaning and applications were vague to her (Emotional Expression and Self Disclosure). I revised the codebook using the feedback she offered.

As the researcher, course designer, and online instructor, I feel the need to articulate the actions taken to address the credibility of this research as it was part of a doctoral dissertation (HossainMardi, 2016). In an attempt to illustrate a true picture of the students’ learning experiences in the online undergraduate class, a mixed methods approach compensated for the individual limitations and exploited their advantages. Student reflections were collected throughout the duration of the course (at the beginning of the course, at the end of the course, and two instances during the course) revealing various aspects of student learning experiences (the phenomenon being studied in this research). Student writing and course creations, video conferencing observations, interviews, and email communication to and from students during the semester for verification and triangulation of student learning experiences. The data analysis had a co-investigator and the feedback from the co-rating was incorporated into the final codebook, which is available in the appendix.

### 3. Results & Findings

The results of the quantitative survey will be followed by the qualitative results of each of the presences in this section. The CoI survey was administered during week 14- of a 16-week course. The purpose was to help gain a quantitative measure of the degree of perceived presence in each of the classes to better understand the context of the classes based on the Community of Inquiry framework. With 17 students in class A and 15 students in class B, the average response rate was 78%.

As shown in Table 1, the rates for teaching, social, and cognitive presence were slightly higher in Class A (respectively 3.67, 3.45, and 3.33) than in Class B (3.56, 3.24, and 2.96). As the slight variation is not the focus of the study, the statistical significance in the difference was not determined. The average presence of both classes out of four is 3.62 for Teaching Presence, 3.35 for Social Presence, and 3.15 for Cognitive Presence. For the results of a four-point scale to be comparable with the results of other studies on the original five-point scale of the survey, the perceived presences are reported in percentages, shown in Table 1.

Table 1. Descriptive statistics of Community of Inquiry survey results

Class	Average TP	Std Dev TP	Teaching Presence	Average SP	Std Dev SP	Social Presence	Average CP	Std Dev CP	Cognitive Presence
A	3.67	0.5	92%	3.45	0.59	86%	3.33	0.63	83%
B	3.56	0.6	89%	3.24	0.53	81%	2.96	0.51	74%
A & B	<b>3.62</b>		90.5%	<b>3.35</b>		83.5%	<b>3.15</b>		78.5%

These data provide evidence that each of the presences existed in both classes. But the research literature does not explicitly define how to make claims about the levels of the perceived presences. In a dissertation studying an informal online English learning community for GRE preparation in China, Sun (2014) mentions the difficulties in making claims about the perceived presences due to the lack of benchmarks in the literature, “Although some studies made

claims about high or low level of the three presences, none of them provided reasons on how the benchmark was decided” (p.133). For an expert opinion, I contacted one of the developers of the CoI survey (Karen Swan, email communication, April 24, 2015) and expressed my concerns of interpreting the survey results. She replied: “*The survey really wasn’t designed to reveal high, medium, or low presences but rather to explore relationships among themselves and between them and other measures. However, I can tell you that when my colleagues and I used the CoI survey to improve our courses, we took anything under an average of 4.0 (or in some instances higher when everything was over 4.0) to be in need of attention. I would guess 4 is high, 3-4 is medium and 3 is low, but I suppose it depends on your context*”.

With this range in mind, Class B’s perceived cognitive presence would be considered “medium” and possibly in need of attention. The remaining presences would be considered “high”. Swan’s email sparked the idea to go beyond the descriptive data and explore relationships among the presences and the 35th item on the survey, overall satisfaction of the course. Table 2 shows the distribution of responses and satisfaction rate of the students.

Table 2. Distribution of Student Responses and Satisfaction Rates

Class	Mean	Mean%	Std Dev	Item Distribution			
				Strongly disagree	Disagree	Agree	Strongly agree
Class A	3.4	85%	0.63	0	1	7	7
Class B	3.4	85%	0.52	0	0	6	4
A & B	3.4	85%		0	1	13	11

One of the 25 students participating in the survey “disagreed” with “Overall, I was satisfied with this course”. Using a filter response feature of Qualtrics, I viewed all this student’s responses. The only two survey items that the student responded unfavourably to were related to the course content (23. Problems posed increased my interest in course issues, and 24. Course activities piqued my curiosity). In other words, the course dissatisfaction of this student was related to the topic of the course and the student’s curiosity and interest in course issues. This information inspired me to further explore the “disagree” category and determine what students had unfavourable opinions about in each of the categories of the three presences.

The survey items that two to five students disagreed with were as follows: the instructor provided helpful feedback, the instructor provided feedback in a timely fashion, online communication is an excellent way for social interaction, felt comfortable conversing through the online medium, course problems increased their interest, and course activities piqued their curiosity.

To obtain contextual evidence to further build an accurate picture of student learning experiences, student reflections were analysed. The results are presented in this section.

### *3.1. Teaching Presence*

According to Anderson, Rourke, Garrison, and Archer (2001), teaching presence has three components: instructional design and organization, facilitating discourse, and direct instruction.

#### *Instructional Design and Organization*

This subcategory is related to the planning and building of a course in terms of structure, process, interaction, and evaluation. “Instructional Design and Organization” was reflected on heavily by students reflecting on their positive and negative learning experiences prior to taking the online course. Planning and evaluation and content delivery were the themes used to code the reflections. Many specific activities were mentioned, such as making a parent handbook using a wiki. How these activities made a strong impact is a topic of further research, but by mentioning the activities in their reflections, students have shown the importance of the type of content educators choose to include in their classes.

Communicating course goals and expectations clearly is an important part of instructional design and organization. One student mentioned this as part of her worst experience, “not knowing what the professor expected and when/being assigned projects randomly without warning”. This is in line with findings from Swan (2008), “clear and consistent course structure supporting engaged instructors and dynamic discussions have been found to be the most consistent predictors of successful online courses” (p.3).

#### *Direct Instruction*

Direct instruction refers to the teacher providing intellectual and scholarly leadership using subject matter and pedagogical expertise. Delivering content, giving feedback, being helpful, and encouraging autonomy are the four themes that emerged from student reflections in this study. Some negative learning experiences were about delivering content in the lecture-only format, “I had a teacher that only lectured information”, and the lack of student participation,

“teacher keep talking [sic], no discussion. Really make me sleepy”. Responding promptly to student questions and concerns and offering them feedback is important in an online class. Some students reflected on instances prior to taking this course when they felt stranded and alone due to the lack of feedback. As the course instructor, I received a few emails from students thanking me for feedback they were able to use to help them improve their assignments.

A subcategory not directly mentioned in the original CoI framework was “Being Helpful”. One student mentioned the instructor’s willingness to help, “I took a class last semester with a wonderful instructor who led great class discussions and was very willing to help when anyone needed it”. While the extent to which the instructor helped his or her student is not known, what is significant is the perception of being helpful, as it identified a satisfaction level from the student in reflecting on their best learning experience. Negative experiences were mentioned, and some that resulted in a feeling of discrimination, “having a teacher not work/help me because I was not responding well to their teaching style and feeling discriminated against because I participated in drama and was not an athlete”. For the students of the online course in this study, knowing help was available to them was reflected in a positive way, “A great class experience that I’ve had was really getting to know the teacher and my classmates, so I knew I would always have options when help was needed”. In this way, students, in addition to teachers, can be viewed as helpful teachers and facilitate positive learning experiences.

Encouraging autonomy is the fourth theme in the subcategory Direct Instruction, also not part of the original framework of the Community of Inquiry framework. This student reflects on the sense of ownership she had and the ability her team had to push themselves further, “I was able to collaborate with my team without supervision, which helped us to really step forward and take ownership in the work we produced during the discussion”. In addition to the hand holding students need from instructors, students also need the space and opportunity to become autonomous learners.

#### *Facilitating Discussion*

Facilitating discussion refers to the teacher establishing and maintaining discourse that sustains social presence and leads to knowledge building and cognitive presence. One student reflected on a negative experience related to discussions. *“I was in a class last semester where no one wanted to participate because we discussed challenging topics such as diversity in the classroom and micro aggressions. Everyone was too nervous to say anything and those that did were completely closed minded and not open to correction or open to being understanding. I felt like I was in a room with people who would be difficult teachers to have (as a student) and many of them actually changed their careers after that!”*

This is an example of the lack of presence of the instructor as a discussion facilitator. Part of Facilitating Discussion is to ease these students who were “too nervous to say anything”, and to steer those who dominate class discussions. As his or her worst learning experience, this student’s reflection illustrates what happens when the instructor has discussions as part of the course design, but does not have a strong presence facilitating them properly.

#### *Teacher Characteristics*

At the category level, this study suggests there is more to these three elements (design, instruction, and facilitation) for teaching presence. The researcher categorized the additional student reflections as a category “Teacher Characteristics”, encompassing teacher’s behaviour and attitude toward students, their class, and course content (as perceived by the students). One might argue that these could fit into a fourth presence such as emotional presence (Rienties, B., & Rivers, B. A., 2014), which is true. Depending on the overall CoI framework one chooses to accept, these student reflections can be housed under emotional presence or teaching presence, as long as it is highlighted that an additional layer of teacher behaviour and attitude was reflected on by students, and is part of the framework looking to provide an optimal learning experience.

What students reflected on specifically was tallied: enthusiasm, passion, and caring had the highest frequency by the students in this study when prompted to reflect on their positive and negative learning experiences prior to the online course. One student illustrates how the teacher’s passion translates into student engagement through reflecting on his or her best learning experience: *“It was obvious the professor was passionate about the subject, and they made sure the students were properly engaged in each activity. It was never a struggle to get the class involved because of their upbeat attitude towards the subject”*.

Students reflected about what their teachers have said with specific statements, descriptions of what they had done, and their overall behaviour towards the students. Some examples are telling the student they would never go anywhere in life, throwing a stapler at a student, and treating them like children.

### *3.2. Social Presence*

Social presence is built on the social constructivist pedagogical theories emphasizing the collaborative aspects of knowledge construction and confirmation. In the early years of computer-mediated communication, online higher education did not have any non-verbal gestures or facial cues to rely on; hence, the effectiveness of communicating and getting to know one another in such a setting was questioned. The focus of social presence was placed on “the degree to

which a person is perceived as ‘real’ in mediated communication” (Gunawardena and Zittle, 1997, p 8; as cited in Swan et. al, 2008, p. 2). As technology evolved, online higher education expectations did as well. Without a clear, agreed upon, definition of social presence, it continues to be redefined (Rettie, 2003; Tu, 2002; Picciano, 2002; as cited in Lowenthal, 2010). One definition of social presence that has guided the coding process of this category is that “student's sense of belonging in a course or group and the ability to interact with others, although physical contact is not available” (Picciano, 2002; p.25).

The indicators referenced for social presence within CoI literature were mainly based on discussions, used for the affective, interactive, and cohesive categories. Examples are humour and emotion expression, asking questions and expressing agreement, and group reference and salutations, respectively. The categories that came about through student reflections in this study align directly with the original categories: present oneself, get to know others, and group cohesion. Example indicators are self-disclosure, connecting, and group commitment.

#### *Present Oneself*

There are two subcategories within Present Oneself: expressions of emotion and self-disclosure.

As the effect of emotions on learning within the CoI framework has been studied over the years, emotional presence has been introduced as a fourth presence (Cleveland-Innes & Campbell, 2012). In addition to the original code expressions of emotion, the concept of emotional presence was also used to guide coding reflections under this subcategory in this study: “the outward expression of emotion, affect, and feeling by individuals and among individuals in a community of inquiry, as they relate to and interact with the learning technology, course content, students, and the instructor” (Cleveland-Innes & Campbell, 2012, p. 283).

Students expressed all-encompassing emotions about enjoying the class, all they have learned and will use as a teacher, and feeling nervous before starting this class. They also expressed many specific emotions about specific instances and activities such as feeling worried about making a website and being passionate about sharing their creations. Student reflections about what they learned about themselves through the team collaboration process elicited self-disclosure from the students such as: “I learned I am very passionate, but sometimes I fail to get my point across clearly. I tend to ramble and need to create a cohesive argument in my head before presenting, also taking into consideration everyone else's opinions”.

#### *Getting to know and Connecting*

Getting to know the teacher and other students and connecting with them in the course are important parts of social presence. The codes are closely related; “getting to know” is more of the initial interaction, and “connecting” is the continuation of getting to know others that takes place throughout the course. One student reflected on getting to know students virtually and feeling connected to them due to the use of asynchronous and synchronous video conferencing tools: “Using Voicethread and Google Hangouts was one of my favorite things about this semester. I have never used either one of these apps before and I thought it was great that even though [sic] I was taking an online class I still felt connected to my classmates because I could see them and talk to them face to face. I thought it was a great way to start out the semester because I was able to see everyone introduce themselves and I could put a face with a name. It was also great because I could interact and present in my pajamas”.

#### *Group Cohesion*

Two subcategories of group cohesion are group commitment and sense of belonging. Early on in the course, students expressed they were surprised that the online course had a group work component. Many of the students had previously taken online courses and expressed not having experiences with online group work. Although mostly negative aspects of group commitment were mentioned in the reflections about their prior learning experiences, students reflected on the positive side of group commitment related to the online course: “I had some struggles figuring out how to use some of the technology - recording my screen is the big one. But I felt really proud when my group and I were having a discussion on our own without too many issues”. The sense of pride and accomplishment as well as producing high-quality work were the products of group commitment.

The other subcategory is sense of belonging. The extent of the sense of belonging in a class is relative. Students’ perceptions of how close and connected they would become during this one-credit hour online class were generally low. During the final synchronous video conferencing session of the course, the interactions between students revealed some teams had developed a sense of belonging and connectedness more than others. Arriving to the hangout session before the scheduled time, smiling, laughing, and making encouraging remarks to one another are some of the contextual indicators.

### *3.3. Cognitive Presence*

Cognitive Presence is the critical thinking and learning piece of the online experience puzzle. Cognitive presence, according to Garrison, Anderson, and Archer, is “the extent to which learners are able to construct and confirm meaning

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through sustained reflection and discourse in a critical community of inquiry” (2001, p.11). They constructed a practical inquiry model which defines four essential phases to understanding cognitive presence in an educational context (2000). By operationalizing cognitive presence through this model, the systematic progression of critical thinking over time is assessed. The phases are as follows: triggering event, exploration, reflection, and resolution.

In the first phase, a problem or dilemma is recognized. Next, participants explore relevant information and move between critical reflection and discourse by brainstorming, questioning, and the exchange of information. Then meaning is constructed from the ideas generated in the previous phase. The final stage is the resolution of the dilemma or problem recognized via the triggering event. In summary, according to the CoI, cognitive presence is “the exploration, construction, resolution and confirmation of understanding through collaboration and reflection in a community of inquiry” (Garrison, 2007, p. 65). This is shown in the far left two columns of Table 3.

Table 3. Alignment of cognitive presence categories between original framework and those presented in this paper

Practical Inquiry Model phases presented in the CoI	Example Indicators	Cognitive Presence categories presented in this Paper	Example Indicators
1. Triggering Event	<i>Sense of puzzlement</i>	-	-
2. Exploration	<i>Information exchange</i>	1. Exchange Information	<i>Respectful exchanges</i>
3. Integration/Construction	<i>Connecting Ideas</i>	2. Construct Meaning	<i>Develop ideas</i>
4. Resolution/Confirmation	<i>Apply new ideas</i>	3. Apply Knowledge	<i>Share creations</i>
-	-	4. Improve & Progress	<i>Improve confidence</i>

Table 3 shows how the cognitive presence from the CoI framework aligns with the findings of this research. Students in this study did not reflect on the sense of puzzlement or triggering of events. In educational contexts, the teacher usually identifies the task or learning challenge. Nonetheless, the second through fourth phases of the Practical Inquiry Model (exploration, construction, and resolution) directly align with the first three categories of this study (exchange information, construct meaning, and apply knowledge).

The other difference in cognitive presence presented in this paper is the element of improvement and progress which the student perceives he or she has made as a result of the critical inquiry processes. Cognitive presence represents the intellectual climate of the learning experience (Garrison, 2003). Part of this is how the learner has changed through this experience. The CoI does not directly address this change, but students reflected on this aspect of cognitive presence.

## Exchange Information

The first stage of cognitive presence seen in student reflections is the exchange of information, consisting of respectful exchanges, discussion participation, and sharing ideas as subcategories. One student reflected on the environment in which these respectful exchanges took place, “I learned that I am able to collaborate in an effective and respectful way with group members that I have not met in person”.

Depending on the context and subject matter, students may have the opportunity to share their ideas with classmates in groups or with the entire class in the online course, students viewed their peers’ projects and gave specific feedback to help them improve or expand their idea. Students who share their projects with the class were invested and interested in knowing what his or her classmates comment and what ideas they share.

## Construct Meaning

Both synchronous and asynchronous activities yielded student reflections pertaining to this meaning construction phase. One student found developing ideas collaboratively helped her individually, “I found working as a group and bouncing ideas off each other actually stimulated my learning process throughout the entire activity”. After explaining how attending synchronous team discussions made her more responsible, this student mentions how she is exposed to new ideas when ideas are developed and reinforced in a group, “The collaboration portion not only helped me to become more responsible, but it also exposed me to new perspectives and ideas”.

## Apply Knowledge

The category apply knowledge is similar to the final phase of Practical Inquiry model, resolution, where students apply their knowledge “by means of direct or vicarious action” using thought experiments and consensus building within the community of inquiry (Garrison, et.al, 2001, p.11). Students apply their knowledge by sharing their creations, sharing their knowledge, and applying their knowledge in the real world. An online student of the educational technology course reflected on how she applied what she learned in the course to complete assignments in her photography class.

### *Improvement and Progress*

A goal of many courses is for learners to reach a level of mastery, leading to improvement in their confidence and refining their skills related to the subject matter. One student reflected on the change she sees in herself, from being nervous to becoming confident throughout this course: *"I believe I deserve an A in this class because of how nervous I was before starting this class and where I am now in terms of my tech savvy. Now I truly have the confidence to use these services which will only benefit my students and myself"*.

She explains that even assignment completion (at the beginning of the semester) did not lead to her feeling that she "had a complete grasp on how to use certain technology". The student perceiving progress or improvement being made is a significant element of cognitive presence.

### *3.4. Learner Effort*

The "Learner Effort" category represents the effort put forth by the learner which is needed to reach the optimal learning experience envisioned in the teaching-social-cognitive presence triad. Through student reflections, we see this effort manifested as two major themes: what they have to do (participation) and what they have to push through (perseverance). The paper does not prescribe this category as a fourth presence, rather it suggests it be considered as a necessary element which is taken as a given in the current CoI framework. In the appendix, categories of learner effort are shown as participation and perseverance.

The two subcategories of Participation are "Class Activity Participation" and "Student's Hard Work". Students reflected on general learning experiences indicating participation leads to positive experiences, such as the reflection in the appendix. Some negative learning experiences were reflected on and related to class activities such as presenting in front of peers or doing busy work. "I spent a lot of time completing mindless paper worksheets that neither inspired me nor taught me. I developed a very negative attitude toward teachers and students alike and I still resent". Specific activities were mentioned, such as staging a protest or writing a handbook. These reflections from students' prior learning experiences illustrate the impact simply participating in class activities has had on the students.

#### *Learner Participation*

As an online instructor, one cannot always tell how much effort students put in course activities. Through the Learning Management System used for the course, the instructor can see how often and for what amount of time students log in. But most of the course activities were embedded outside the LMS, and the time spent completing the tasks was not visible. The second dataset (Why you deserve an "A") addresses this subcategory directly. One student reflects on the hard work put into assignments, which may not be visible: "Some [assignments] were not perfect but I put every ounce of energy I could into them". It is of value because it shows the student's perception of learner effort.

In addition to the students reflecting on their taking part in the course, what and how they attempted to persevere and persist through the course was also reflected on. The areas were subject matter issues, technical issues, and personal issues. The subcategory of perseverance is directly related to student retention.

#### *Learner Perseverance*

The three subcategories that surfaced in student reflections were Overcoming Subject Matter Issues, Technical Issues, and Personal Issues. Due to the technical nature of the educational technology course, the exact border between these two issues is not clear and the examples were grouped together in this section. One student, who faced many technical issues throughout the course, reflected on why she deserved an "A" by explaining how she dealt with her issues, "I think that I dodged initially problematic technological issues by coming up with alternate ways to do things while still proving that I did the work". This student who disclosed, "I know little to nothing about technology" at the beginning of the course interchanged various tools when she encountered technical issues to achieve the assignment goals by the end of the course.

Students face and try to overcome personal issues to learn and to complete their courses. This student reflected that her life distracted her, "I had family issues, technical difficulties, and overall a complete distraction from this class. This was the first semester where life exceeded my expectations and completely messed with my school schedule". Personal issues affect students in face-to-face and online classes, but online classes add an additional constraint with deadlines early on in the semester to ensure participation.

## **4. Discussion**

Student perceptions of their online learning experiences were examined through the analysis of the 35-item survey. The quantitative results of this study revealed the need to further explore student learning experiences. The lens chosen to do so was student reflections in which the elements of the CoI framework were not explicitly mentioned in the prompts. Through responding to these reflection prompts, insight into the components of their learning experiences was gained.



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I examined student reflections, reports, and discussions, and found that the cognitive presence presented in the student perspective aligns with what the Community of Inquiry framework presents. Even though the categories and subcategories of cognitive presence that are shown in the codebook differ from the original framework, the underlying concepts are similar.

Based on evidence from this study, I believe the social presence from the student perspective incorporated more feelings and emotions than addressed in the social presence in the Community of Inquiry framework. Between social and cognitive presences, there are clear interactions visible in student reflections and reports. The impact and direction of these interactions can be studied in future research projects to better understand how to enhance student learning experiences online. Also, in the interviews, both students seemed to have the preconception that a sense of community could not be formed in an online class. Therefore, the amount of sense of connectedness and belonging that *was* developed in the course studied was a lot. The attitude and preconceptions of students taking online classes are also worthy of future studies as it impacts their learning experiences.

Student reflections of their learning experiences revealed a similar framework to the original Community of Inquiry model (Garrison et. al, 2001), with the addition of a fourth component: learner effort. Based on this research, I do not prescribe or suggest a fourth component called Learner Effort to be added to the CoI framework, but recognize that within the context of this study, learner effort played an important role in creating an optimal learning experience for the study's participants. Based on learner effort evidence in this study, and research done in the field of learner presence (Shea & Bidjerano, 2010), I suggest a re-evaluation of the tri-presence model and question the rigidity and sacredness of the structure in an ever-changing world of education.

At the subcategory level, differences with the original CoI framework such as “teacher characteristics” in teaching presence and “improvement and progress” in cognitive presence can be seen. The appendix shows the next level within each subcategory, the themes or codes.

This study adds to the body of knowledge of the CoI as it builds upon this framework and adds the student perspective using reflections. The results of this study have implications for researchers who choose to research reflections using the Community of Inquiry framework as it provides a codebook for them to begin their research with. It may inspire other researchers in this field to look for new data sources and formats to re-evaluate the CoI framework to better understand learner experiences. For online instructors in higher education, the study offers themes for them to pursue and improve their online teaching, such as being helpful, encouraging autonomy, and the overall impact of the attitude and behaviour of the instructor. Course designers can benefit from this study as it sheds light onto the intersecting components of the CoI elements which can help give them a better understanding of what leads to an optimal learning experience.

Due to the extent of the sample size and homogeneity, generalizations for all higher education institutions cannot be made based on this study. The research itself is limited in that not all the interactions and assignments in the classes were examined. There are other limitations to this study, the largest being that part of the reflections analysed in this study were from students' prior learning experiences (first dataset) which were not limited to online learning experiences. In response to this limitation, I draw from the background and basis of the conceptual framework used in this study: *the Community of Inquiry*. Garrison (2015), one of the three developers of CoI states: *while the CoI framework has focused on online and blended learning approaches, its source of inspiration was not in these areas of study and practice. Its philosophical and theoretical foundation has its genesis in traditional higher education and as such, is generalizable to purposeful learning environments that are committed to collaboratively constructing personal meaning and confirming understanding* (p.85).

This research pulled from students' learning experiences in the traditional format as well as the online form. Like the CoI itself, the findings of this study have implications for all purposeful learning environments, although the focus is on online higher education.

Another limitation to this study was that I was the instructor and the researcher. I had a responsibility to my students to put their educational goals first, always before my own research. My presence throughout the discussions impacted the team dynamics. The discussions in the course were designed to increase student interaction and decrease their reliance on the instructor. Therefore, my role as participant and observer changed as the discussion progressed during the semester. In the first discussion, I was a “participant as observer”, when my role as the instructor and participant come before observing (Merriam, 2009, p. 124). In the second discussion, I tried to minimize my role as an active participant and increase the amount of observation as a means of scaffolding my presence. In the final discussion, I was a “complete observer” as the participants carry out and record the synchronous video conferencing discussion and I observe it without any participation (Merriam, 2009, p. 124). I understand that the “mix of participation and observation is likely to change” even without my intention to scaffold considering my relationship as a teacher changes with my students as the semester goes on (Merriam, 2009, p. 126).

Further research can be done in the field of exploring students' learning experiences through the students themselves. If a researcher were to replicate this study, I would suggest s/he add another item to the CoI survey, regarding learning perception. Akyol & Garrison (2014) did so and added the item “I learned much in this course” for the students to respond to. Another venue is to compare student responses to the CoI survey to the Sense of Community Index (Rovai, 2002a) for researchers looking to obtain more information quantitatively. For a more extensive

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qualitative approach, I suggest conducting student interviews throughout the semester in addition to collecting their written reflections.

An important area of research in online education is grit and perseverance. One student mentioned how she dodged technical issues by completing the task using alternative ways. The interactions between Learner Presence and Emotional Presence with the focus of understanding how grit is enhanced or hindered is a research area worth pursuing. Issues of Learner Effort and the impact the online environment has on student's learning experiences were also topics outside the scope of this study. Differences between student reflections about how the online environment of the course caused them to feel more shy, more confident, connected, or capable raised the issue for the researcher.

The only student in this study who was not satisfied with the online course was not interested in the course topic (based on CoI survey response). If student satisfaction is related to retention and learning, then research can be done to understand what to do when students lack interest in the topic within the time frame of higher education courses which are usually only 8 to 16 weeks long.

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**Appendix: Codebook of Presences base on Student Reflections**

Category		Subcategory	Reflection Example of Teacher Presence
TEACHER PRESENCE (TP)	Instructional Design & Organization	Planning & evaluation	"The course was very unorganized, as well as the professor. No one was ever on the same page as the professor"
		Content development	"Having the teacher include hands on activities in their lessons was one of the great classes I experienced"
	Direct instruction	Content delivery	"The best class experiences I've had is when teachers deliver their content in new and exciting ways. There is nothing worse than a boring lecture again and again"
		Give feedback	"One online class I took last fall, it was near impossible to get a response from the instructor in a reasonable amount of time"
		Being helpful	"My anatomy and physiology class in high school would probably have to be my greatest classroom experience because my teacher invested so much of his time into the students and into helping each of us succeed, not only in his class but with graduation and college"
		Encourage autonomy	"I got a better understanding of how voice thread and google hangouts both worked because I was required to set them both up on my own"
	Facilitating Discussion		"it was an amazing psych class that was full of discussion both formal and informal. I love building close relationships with people because it makes discussions more intimate and passionate. I feel that everyone needs to feel safe with each other to comment on tough or controversial subjects"
	Teacher Characteristics		"it is always very frustrating when I can tell that a teacher/professor is obvious about the fact that they do not want to be there and they aren't interested in the students success"
Category		Subcategory	Reflection Example of Cognitive Presence
COGNITIVE PRESENCE (CP)	Exchange Information	Respectful exchanges	"I learned that playing different roles kept the conversation interesting and gave an opportunity for different opinions, whether you agree with them or not"
		Discussion Participation	"The interaction between myself and team members was good for me because I could ask questions and get clarification"
		Share Ideas	"I have received so many great ideas from my peers and am very excited to put my own spin on them in the classroom"
	Construct Meaning	Develop and reinforce ideas	"I love collaborating with people, reinforcing their ideas with more ideas, and sharing a common excitement in teaching!"
	Apply Knowledge	Share creations	"There are simply too many resources on Graphite for me to discover on my own, so hearing everyone else's discoveries was very helpful and exciting"
		Share knowledge	"I love when I can bring my own knowledge to the class that others can find beneficial. Such as when I have had experience in a classroom and can give real life stories to share"
		Real world application	"This class made me explore different technologies that will give me more creative opportunities teach my future students"
	Improvement & Progress	Improve confidence	"I was super worried about the website, at the beginning but was excited towards the end! It really is not THAT hard!"
		Improve skills	"This class helped me become a better researcher This class helped me become a better student because I was always held accountable for my mistakes and achievements"

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Category		Subcategory	Reflection Example of Learner Effort
LEARNER EFFORT	Learner Participation	Class activity Participation	“I really like fun classes, class that I like and I can really participate in it”
		Student’s hard work	“I took each assignment to heart, made sure that –even if I disliked the assignment or found it difficult- that I pursued to the end and made it work for me in a way that would help me through my future teaching career”
	Learner Perseverance	Subject Matter	“Like many classes, there were struggles but through the collaboration aspect of the class, I was able to push past the difficulties with the help of fellow classmates”
		Technical issues	“[X], [Y], and I struggled with several components of the technology portion of this assignment, but we worked hard to overcome the challenges we faced together as a group”
		Personal Issues	“I also am naturally shy, so the google hangout discussions were a challenge for me because it is hard for me to ask questions and put myself out there. The hangouts were a good way for me to improve that”
Category		Subcategory	Reflection Example of Social Presence
SOCIAL PRESENCE (SP)	Present Oneself	Expressions of Emotion	“Learning calculus from a very enthusiastic Russian Professor, I love her she was absolutely great!”
		Self-disclosure	“I have always struggled in math” “I took the wrong version of a test one time”
	Get to know others	Getting to know	“The teacher got to know us as people”
		Connecting	“I love presenting interactive presentations that engage other classmates!” “Teacher and students had good relationships and attitudes towards one another”
	Group Cohesion	Group commitment	“I do not enjoy when I am in a group and I have team members who do not pull their own weight and still receive the same points that I do when I put in the effort”
		Sense of belonging	“In my Bio lab here at UMSL, the teacher and the students just really clicked. While doing some lab work, we all listened and sang to Disney music. I like that sense of connectedness”