

Establishing Cognitive Presence to Enhance Students' Engagement in an Online Learning Setting

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ABSTRACT: This action research was undertaken with a research question 'How can I establish cognitive presence to enhance students' engagement in an online learning setting'. This was adopted as my action research question after observing minimal student engagement in google classroom. Participants were seven grade students of the school I teach. Data was gathered mainly through records from google classroom using checklist; however, self-reports and conceptual analysis were used to get a comprehensive result. Intervention strategies were adapted based on the analysis of surveys done and feedback received from students. After three months of intervention process, the result showed significant improvement in the student's overall level of engagement.

Key words: cognitive presence, online learning, students' engagement.

I. INTRODUCTION

The COVID-19 has led to the closure of schools and other educational institutions all over the country. This established the readiness of education to deal with such emergencies that entails the help of advanced technology to allow effective online learning. Online learning is education that takes place over the Internet. In Bhutan Google Classroom (GC) turned out to be the most prevalent online learning platform for high school students during the school closure. Google classroom is a free app which works as an all-in-one online learning platform. However, most teachers in the country were unprepared for the shift to online teaching. The alteration in mode of teaching and learning became challenging then. To give diligent attention to students' learning engagement, communicate and manage for a successful learning experience are the challenges that I faced.

Similarly, Fein & Logan (2003) explained that teachers face challenges at three phases with online education: the design, the delivery, and the

follow-up. Significantly, Anderson, Imdieke, & Standerford (2011) stated that they saw one of the main encounters as the "disconnect between the way teachers were taught to teach" (p. 4), and how the course content must be delivered effectively in online classroom. So, a teacher must explore active and engaging activities that would provide a rewarding learning experience. In the words of Adebisi & Oyeleke (2018), "effective teaching strategies help activate students' curiosity about a class topic, engage students in learning, develop critical learning skills, keep students on task, engender sustained and useful classroom interaction, and in general, enable and enhance the learning of course content" (p. 168). Therefore, a teacher should adopt teaching strategies that would engage students to promote meaningful online learning experiences.

Hence, cognitive presence, a sense of "being there" cognitively, has lately been considered as an important factor for students' engagement in online learning. Garrison, Anderson, & Archer (2001) define cognitive presence as 'the extent to which learners are able to construct and confirm meaning through sustained reflection and discourse in a critical community of inquiry'. Cognitive presence is a significant factor in facilitating learners' engagement and in affecting a learner's level of attainment and fulfilment (Wang & Kang, 2005). So, this action research was to find out how creating cognitive presence through varied learning activities would improve students' online learning engagement and provide me prospect for future improvement.

II. RECONNAISSANCE

Reconnaissance is derived from a French word 'reconnaitre' which means to look at. In the words of Mills (2007, p.26) "reconnaissance is taking time to reflect on your own beliefs and to understand the nature and context of your general

idea". According to Maxwell (2003), reconnaissance has three parts, namely, situational analysis; competences and literature. These three components of reconnaissance are discussed below.

2.1 Situation Analysis

After the school closure on 6th March, 2020 in response to COVID- 19 exigencies, teachers were tasked with executing online teaching and learning modalities, with little guidance, training, and resources. I was unprepared to support continuity of learning and adapt to new teaching methodologies. I did not get any training on online teaching approaches and skills required to aid in promoting better learning for students. Thus, I applied what I found to be right and useful for students' learning. Like all other teachers I assigned a few text questions related to the topic as per the schedule. The teaching and learning were purely through asynchronous interaction. However, the students turned in for the lessons in the google classroom was not encouraging. For every task assigned, nearly half of the students used to miss it. I was confused and frustrated with large number of students not 'showing up for the lesson' in the google classroom. Besides, I used to get a good number of assignments with same answers copied from internet or their friends or forwarded images of their friend's work. Most students were inactive, lacked enthusiasm to learn and disconnected from the process of learning.

Therefore, I did a short survey on my online teaching via google forms. More than 50% of the students said they do not prefer online classes as they were not able to learn and understand the concept and lesson expectations. And nearly 50% of students said that; audio narration, video lessons, short clips related to the topic, simplified text, would help them to promote their learning engagement. Likewise, 45% of the students stated that they choose to have effective online classroom questioning, and learning tasks that would promote their interest and thinking. Besides, a study carried out by Paro District, 'Impact of COVID 19 on Education and Effectiveness of Education in Emergency (EIE)' (2020), recommended teachers of Paro to create their own video lessons to help promote students' learning engagement.

Subsequently, I felt that there are issues to quality and effectiveness of my online teaching and learning. So, I have decided to find out ways to promote student engagement in online learning.

Therefore, in this research I have considered four phases of 'Cognitive Presence' of 'Community of Inquiry Model' when implementing intervention strategies. Meanwhile, Garrison, Anderson & Archer (2001) identified cognitive presence as one of the key factors in facilitating students' engagement in online learning.

2.2 Competence

Researcher did Masters in Education and did conventional and action research as a part of the course. Moreover, I have attended a five-day workshop on Action Research conducted by the district, which complemented the ideas and knowledge possessed on research. Besides, the school is in an urban area where researchers have access to internet facilities and easily get support from experts in the field of research.

III. LITERATURE REVIEW

3.1 Engagement

The Macquarie University Learning and Teaching Centre (2009) defined engagement as "the extent or quality with which students are committed and actively involved in their learning" (p.1). Similarly, Great Schools Partnership (n.d.) states "Student engagement refers to the degree of attention, curiosity, interest, optimism and passion that students show when they are learning or being taught, which extends to the level of motivation they have to learn and progress in their education" (para 1). Engagement is a concept used widely in learning to clarify a variety of behaviors that students show in the learning environment. So, student engagement in online learning is an engagement when using online learning platforms to learn, including behavioral engagement, cognitive engagement, and emotional engagement (Min et al., 2016).

Fredericks and colleagues (2004) defined behavioral engagement as participation, effort, persistence, and positive conduct while involved in a set of activities. It comprises observable behaviors in the learning process which includes student's participation in lesson activities. Equally, Mosher & MacGowan (1985) highlighted the behavioral features of engagement and defined it as "attitudes toward the learning program or participatory behavior" (p.14). While cognitive engagement relates to learners' investment of thought, mental effort, or learning achievement strategies (Lewiset al., 2011). It comprises mental

effort in learning, and the practice of different learning strategies to promote thinking.

Importantly, overall engaged students are better students, who can attend vital instructional events (Zepke & Leach, 2010). When students are actively engaged, there is “transition from being mere recipients of information to being participants actively engaged with new information in learning environment” (Coastal Carolina Community College, n. d., para.1). “Therefore, it is imperative that we learn what engages students to offer effective online learning environments” (Dixson, 2010, pg.1). Incidentally, some fail to “make a transformational shift in their approach to teaching from one of disseminating information to one of creating learning environments where students co-construct knowledge through interactions” (Vaughan, 2010, p. 61). Consequently, online learning must be transformative (Budhai & Williams, 2016). Hence, good task design is the key to promoting student engagement and participation (Mcnaught, Lam, & Cheng, 2012).

3.2 Cognitive Presence

Cognitive presence is learners’ ability to reflect, reconstruct, and confirm meaning through participating in reflective discourse practices (Garrison & Arbaugh, 2007). It is the learning environment strategically designed by instructors and conducive to meaningful learning. Instructors develop rich discussion questions and help the students connect factual, conceptual, and theoretical content (Pelz, 2010). The weekly course content can be assessed to make sure it activates cognitive processes and deep learning (Coppola, Hiltz, & Rotter, 2002). The goal in deep learning is to move discussion from exploration to integration and then to resolution. It is explained through Practical Inquiry Model of learning which has four phases (Garrison & Anderson, 2003):

1. Triggering event: The first phase is the recognition and definition of the problem or issue. Learners recognize the problem and have a sense of puzzlement by the given question or task.
2. Exploration: The second phase is the exploration of the problem or issue through the gathering of relevant information and perspectives through individual searches and discourse.
3. Integration: The third phase is making sense of the existing information with the goal to reach resolution through reflection, sharing and

critically analyzing the best ideas. Learners reflect on the task, link ideas, and try to come up with solutions. The indicators of this phase also include convergence among group members or within a single message.

4. Resolution: In this final phase, learners apply the knowledge created to new situations; they test solutions or defend solutions.

Tolu (2013) states that “Cognitive presence, tasks and even the questions must be carefully designed and worded to promote critical and reflective thinking” (p. 1054). The focus of cognitive presence is to help students develop the means to move beyond the early stages of learning to the stage where learning has meaning and where they can understand and apply new concepts. However, a few critical factors to consider includes enhancing learner autonomy, making use of various learning sources, providing timely and constructive feedback, and encouraging student input (Tolu, 2013).

IV. ACTION RESEARCH QUESTION

How can I establish cognitive presence to enhance students’ engagement in an online learning setting?

V. INTERVENTION STRATEGY

After my analysis of student’s participation in online classes, survey questionnaire, and feedbacks from the students I have developed learning activities which would offer opportunities for students to integrate key concepts, explore related resources, bring new knowledge and new ideas into the learning process. The learning activities were supplemented with videos, powerpoint slides, excerpts, voice over powerpoint to illustrate the concepts. The activities designed were in line with the activities suggested by Instructional Design for eLearning (2016).

The type of activity questions designed were

- Open ended question which would encourage experimentation, divergent thinking & multiple perspectives.
- Reflective questions
- Assignment that requires students to combine new information to answer it.
- Case study.

Some activity questions designed were as follows:

Between 19% and 29% of global greenhouse gas emissions come from food production, with beef and lamb the biggest contributors, so shifting diets towards greater fruit and vegetable intake is a promising strategy for reducing climate change.

1. How do you think the consumption of beef and lamb contribute to global warming?
2. Do you think Bhutan is a major contributor of greenhouse gases? Why?

In 2018, it is reported that the population in Japan is shrinking and that there are more adult diapers than baby diapers in Japanese supermarkets.

1. What is the cause of the situation?
2. Do you think the above situation will have an impact on population change? Explain.
3. What must be done to avoid a similar problem in Bhutan?

VI. METHOD OF DATA COLLECTION

Chapman summarized five methods used to evaluate student engagement in relevant research: Self-Reports, Checklists and Rating Scales, Work Sample Analyses, Direct Observations and Focused Case Studies (2003). Amongst, I have used checklist to keep record of students behavior engagement in online learning in GC. I have equated behavioral engagement to the number of times a learner submits or responds to his or her assignments. The data were collected from the GC archives and accordingly, the graph is generated.

To understand the students' cognitive engagement in online learning, I have used self-reports where students respond to items using specified response format. Today, many of the instruments used by researchers to measure cognitive engagement are focused on specific discipline and context and cannot be used across a variety of tasks and settings. Therefore, a factor 'cognitive problem solving' and the 'items' were adapted from 'Exploring Factors, and Indicators for Measuring Students' Sustainable Engagement in e-Learning' by Lee & Hong, (2019). All items listed by Lee & Hong (2019) are found to be related to cognitive processes for e-learning activities and are found relevant to this study. So, in these self-reports participants were asked to respond to each item with five possible responses; Strongly Agree (SA), Agree (A), Neutral (N), Disagree (D) and Strongly Disagree (SD). The responses were then

imported and generated data in percentage for analysis.

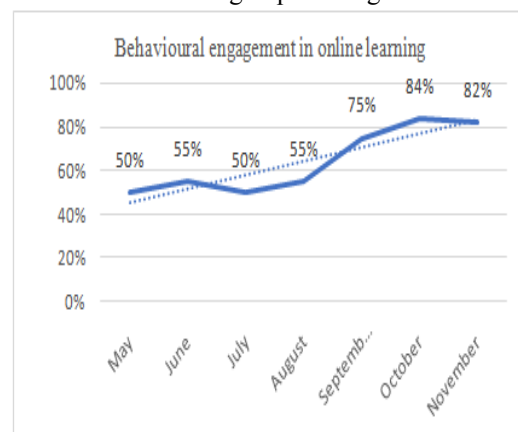
Besides, to get a complete understanding about the cognitive engagement I did conceptual analysis. Each student's answers were read and concepts were categorized as judging, applying knowledge, deriving an idea, analyzing, and approaching with a new perspective. The focus was on the occurrence of the concept within a text. Then, the data were quantified and tallied its' presence.

VII. DATA ANALYSIS

7.1 Behavioral Engagement

The intervention strategies were applied from the month of September to November. At least two different activities were given in a month considering four categories of cognitive presence. The behavioral engagement status of the students (in percentage) in each month is given below.

Graph 1: The Behavioral engagement in online learning in percentage



Graph 1 showed that students' behavioral engagement in GC gradually increased from September. In September, 75% of the students responded to lesson activities and submitted their assignments. Likewise, in October 85% of the students showed the same behavior engagement. While, in November 82% of the students actively answered to lesson activities. Maximum students time-on-task behavior shown was in the month of

October. However, it exhibited that 100% students' participation was not achieved in all the months.

Table 1: Cognitive engagement; statement and response for online classes in GC

Statement	Response				
	SA	A	N	DA	SD
I can judge the value of the information related to the knowledge learned in my online classes.	33.3	61.9	4.8	0	0.0
I tend to apply the knowledge I have learned in online classes to real problems or new situations.	42.9	52.4	4.8	0	0.0
I can derive new interpretations and ideas from the knowledge I have learned in my online classes.	28.6	52.4	19.0	0	0.0
I try to approach the subject of my online class with a new perspective.	23.8	61.9	14.3	0	0.0
I can deeply analyze thoughts, experiences, and theories about the knowledge I have learned in my online classes.	42.9	42.9	9.5	0	4.8

Adapted from Lee & et al., (2019)

Table 2: Cognitive engagement level and description for online classes in GC

Sl. No.	Cognitive Engagement Level	Students who fulfilled the level (n=43)	Examples of description
1	Judging	72%	- it is due to declining in birth rate - the country is non industrial country
2	Applying knowledge	60%	- shifting our diet to fruits and vegetables is best the strategy - we should continue to support good forest cover
3	Deriving an idea	58%	- it is due to agricultural processes - it because imbalanced population
4	Approaching with new perspective	60%	- good study of population is important - we are the creator of imbalanced environment
5	Analyzing	67%	- small group of adults will affect the country - population will decrease

Adapted from Lee & et al., (2019)

7.2 Cognitive Engagement

Table Revealed that more than 33.3 % of student participants strongly agreed that online classes supported them to judge the value of the information related to the knowledge learned. While 42.9% of participants strongly agreed that they tend to apply the knowledge learned in online classes to real problems or new situations and they

can deeply analyze thoughts, experiences, and theories about the knowledge learned in my online classes. Likewise, 28.6% of the students strongly agreed that they can derive new interpretations and ideas from the knowledge learned in the online classes. Lastly, 28.3% of the students strongly agreed that they try to approach the subject with a new perspective. Importantly, it demonstrated that

most students were engaged in high level of internalizing cognitive tasks.

Table 2 presented that 72% of the students made judgments about something based on criteria and standards. And 67% of the students examine a subject from different viewpoints. Whereas, 60% of the students used learned material in new situations and approached it with new perspectives. But, 58% of the students derived a deep discipline understanding of an idea. Notably, most students were engaged in deep cognitive aspects in the learning process and it agrees with table 1.

VIII. RESULTS AND DISCUSSION

The finding of this study indicated that online behavioral engagement can be enhanced by shaping the environment and planning each class session prudently. Adapting to the online setting calls for careful selection of instructional strategies along with relevant tools and appropriate questions for effective learning engagement. Fostering cognitive presence has the potential to promote behavioral engagement. Students in online learning where instructors demonstrated and facilitated cognitive presence reported increased curiosity, interest, motivation, and engagement with the subject (Meina, Susan, & Curtist, 2019). So, the teachers' role is to facilitate the opportunities, using appropriate pedagogical processes and e-Learning affordances" (Wright, 2010, p. 24).

The study also showed that creating cognitive presence promotes learner's opportunity to learn through exploration of issues and ideas from different landscapes. It encouraged experimentation, enabled students to connect to their experiences, life, real world and made meaningful learning. Bruner (1990) rightly mentioned that we make sense of our environment from experiencing phenomena and interpreting those experiences based on what we already know, reasoning from them, and reflecting on the experiences and the reasoning. So, cognitive presence reinforced students to use their own judgment to begin analyzing the knowledge they have learned and distinguished between fact and opinion and to infer relationships among sources.

In addition, the study also demonstrated that starting cognitive presence allowed students to reflect upon their learning experiences and make judgments about the value of ideas, items, and materials. It enabled students to mentally assemble all they have learned to make informed and sound evaluations of the material. Therefore, Brookfield

(1989) argues that instructors should require learners to reflect on their experiences, using a "critical incident" (e.g., case history). Congruently, Baynard Woods (as cited in Plaut & Plaut, 2009) stated that it is our responsibility as educators to "give them time and opportunities to reflect on their own work and their own thinking" (p.16).

The study clearly indicated that establishing cognitive presence in online learning advanced cognitive opportunities such as analyzing, evaluating, solving problems, logical reasoning and making rational judgements. It has a great potential to enhance online behavioral and cognitive engagements. This finding agrees with the study conducted by Oriogun, Ravenscroft, & Cook (2005), that cognitive presence can be used for online groups for measuring the cognitive engagement of online learning.

IX. LIMITATION

However, there are some notable limitations with my study, such as restricted sample size and participants being only a section of VII grade students. The result would be more authentic and applicable to the general population if the participants were also from other grade levels of different locations, and schools.

The current study employed a checklist, self-reports, and conceptual analysis to get reliable results. However, a self-selection bias might be present, as I did the conceptual analysis. Thus, interviewing students and having critical friend to confirm the data in future studies will allow a fuller understanding of the question. And another drawback the research holds is that it adopted only few intervention strategies and time span considered for the research seemed short.

X. CONCLUSION

Engagement in online learning is an important aspect of examining students' learning development, and the form of engagement is an imperative sign of online learning effectiveness. This finding revealed that online learning should facilitate learners' cognitive presence to promote online behavior and cognitive engagements. Strategies like reflective assignments, open ended questions, problem-based learning, and questions that generate different perspectives with use of varied instructional tools nurture learners' cognitive presence. With cognitive presence, students are efficiently engaged in online learning.

This study has given me confidence that I can successfully engage students on online learning amidst the current situation. It also created a room to explore online instructional strategies to intervene in different dimensions of students' engagement. In future research larger scale quantitative and qualitative methods should be combined to examine students' learning engagement.

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