Assessments of Student's Emotions and Their Relevance in Online Learning

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Abstract

Emotions are closely related to the feelings that exist in humans as a result of events or factors that occur around them, where they manifest in specific situations. Students' emotions are easily visible in traditional or face-to-face classrooms, and teachers can recognise emotional presence. Emotions can have a positive or negative impact on a student's learning capacity and motivation. Emotions have an indirect impact on student's cognitive ability to learn. Because of the physical absence of teachers in online learning environments, it is difficult for teachers to see and assess emotions. This concept paper examines the role of emotional presence in the learning process based on a Community of Inquiry framework. This paper also discusses several assessment methods used by previous researchers to assess emotional presence in the online learning environment. The effects of emotional presence on online student learning will also be discussed.

Keywords: Emotional Presence, Online Learning, Learning Management System, Community of Inquiry.

Introduction

Technology has taken over many roles in industries over the years and is rapidly expanding in our lives. In some ways, technology was intended to solve immediate problems and carry out activities faster and better than traditional methods, as well as to improve and increase efficiency (Emoavwodua, 2018). This is especially true in the education sector, where technology has greatly increased access to the educational field. The majority of formal teaching and learning opportunities are now available online. The number of students taking online courses has risen dramatically in recent years, particularly since the COVID-19 pandemic began in 2019. From early education to tertiary education, all parties in the educational sector are being forced to transition to fully online learning. However, the implementation of online learning and its efficacy remains a mystery. There are numerous factors to consider for students to have a meaningful online learning experience and excel academically. One aspect to consider is the student's emotions as they emerge during online learning.

Extensive research on human emotions has been conducted over the last decade. Human emotion research can be found in a variety of fields of study, ranging from developmental cognitive neuroscience to applied and social sciences. Unfortunately, in the development of education and instructional settings, emotion and learning have received little attention. As a result, considering students' emotions in the context of online learning may appear absurd. Humans, whether in the traditional classrooms or online learning environments, crave meaningful interaction. In addition, there is a growing body of literature that acknowledges the importance of emotions in the teaching and learning process. The last decade has also seen a growing recognition of the role of emotions, and recent studies have produced new insights demonstrating that emotions profoundly affect students' engagement, achievement, and identity, implying that they are critical for educational institutions' and society's agency (Boekaerts & Pekrun, 2015).

Students' emotional states during the learning process can influence their engagement and motivation, as well as their cognitive level, which leads to an improvement in academic achievement. It is critical to consider how students are feeling during the teaching and learning process, whether in traditional classroom or online learning settings, because there is evidence from a variety of sources that indicates emotions play a powerful role in learner engagement and achievement, and that the role of emotions in online learning requires special consideration (Artino, 2012; Rienties & Rivers, 2014). As a result of the increased accessibility of technologies in teaching and learning, the concept of considering human emotion is spreading from the physical classroom to online learning communities. This concept paper will discuss the roles of emotional presence in online learning and assess them using a few methods used in previous studies. Furthermore, the implications of emotional presence in online learning will be discussed in greater detail in the following subsection.

Emotions in Online Learning

There are numerous ways to define emotions in various terms. Emotions are typically defined as

"multifaceted phenomena involving sets of coordinated psychological processes, including affective, cognitive, physiological, motivational, and expressive components," according to Shuman and Scherer (2014). For example, nervous, uneasy thoughts or feelings (affective), fears of failure (cognitive), increased heart rate (physiological), urges to flee the situation (motivation), and an agitated facial expression all contribute to a student's anxiety before an examination (expression). Emotions have long been thought to be an important and necessary component of the learning process; however, it is difficult to define precisely the emotional experience in text-based evidence when it comes to online learning settings (Cleveland-innes & Campbell, 2012).

Drew (2019) stated that learner feelings and emotions can have an impact on learning in four ways: motivational impact, psychological impact, social impact, and cognitive impact. Because of technological advancements, learning is expanding beyond classroom settings, reducing the visibility of emotional presence among students. This is based on nonverbal cues such as facial expression and accentuation, which are not visible in an online environment (Stenbom, Hrastinski, & Cleveland-Innes, 2016). Because of a decrease in nonverbal cues assumed to convey emotional information, online communication exchanges lacked emotional tone or content (Hancock, Landrigan, & Silver, 2007).

Although most teachers or online instructors want their students to have a positive, happy, and engaging learning experience, measuring such emotions is a difficult task because emotions are very subjective, especially when they are instinctive and physical, such as triggering physical responses to threats (fear) or rewards (reward) (happy). Measuring objectively bodily reactions based on pupil dilation (eye-tracking), heart rate, skin conductance, facial expressions, and brain activity is possible, just as it is in traditional classrooms (Farnsworth, 2020). Students' emotions can be easily seen in a face-to-face classroom, but not in an online learning setting. For example, in a face-to-face setting, cues such as smiling, making eye contact, and knowing students' names have a significant impact on developing trust and connection with the students. These emotional cues may entice them to participate more actively in line classes, but other influencing factors, such as learning environment, learning process, and learning outcomes, must also be considered (Stephan, Markus, & Gläser-Zikuda, 2019). As a result, in an online course setting, there must be a concerted effort to include cues that support emotional presence. For example, analysing written text in discussion forums or online chats by looking for keywords such as "frustrated," "overwhelmed," and "exciting" may provide insight into learners' emotions. Aside from keywords, learners may express their emotions using emoticons such as ":-)", ";-)", or ":-(".

Assessing Student's Emotions in Online Learning Environment

Assessing and measuring students' emotions in online learning may not provide a 100% accurate representation of how the students feel and experience the emotions. Nonetheless, there have been numerous attempts to assess the student's emotions using various methods from previous research. However, many previous studies relied on standard self-reporting tools. Even though measuring emotion may appear difficult, Farnsworth (2020) believed that emotions can be measured objectively through some observations such as pupil dilation or eye-tracking, skin conductance, brain activity, heart rate, and facial expressions, but only in traditional face-to-face settings. Because feelings are subjective in online learning environments, they can be measured using self-reporting instruments such as interviews, surveys, and questionnaires, which include rating scales and self-assessment methods.

Additionally, Rienties and Rivers (2014) found and summarized that there are 7 data gathering approaches to measure and understand emotions based on the previous studies on emotions in learning, where 3 of the methods were using the existing data from common virtual learning environments e.g., Learning Management System (LMS);

- Content analysis – could be done manually by annotating the indicators of opinions and emotions in written text, or by using a coding scheme based on the existing contents. For example, a study by Stenbom, Hrastinski, and Cleveland-Innes (2016) performed content analysis of conversations in forum discussions by identifying the categories based on the emotional presence coding instrument.

- Natural Language Processing (NLP) – a method by using automated systems to identify emotions in written text based on phrases that have been set such as the phrase containing the word "I feel.." across millions of blogs which has been set by Dodds and Danforth (2010) in their blog analyser that they developed.

- Identification of behavioural indicators – assessed through learner's behaviour in any records of communication like a transcript of discussion forums or transcript of recorded synchronous discussions e.g., video conference and chat. In a study by Derks, Bos, and Grumbkow (2007) they requested learner to join in online chats using text, emoticons or both and identified the indicator which used the most or less in a positive or negative discussions. Other than that, there are some researchers who utilized other behavioural analytic tool as Social Network Analysis (SNA) to investigate the pattern of interactions among learners through the use of networks. For example, Makos (2014) was thrilled how 'Like'

buttons could enhance social unity by bring up positive feelings and inspiring deeper learning.

At the same time, Rienties and Rivers (2014) also argues that with the learning attitudes as in emotions and motivations shown by learner while the behaviour assessment is ongoing, teachers can assist the at-risk learners at the early stage of their learning journey. While the other 4 methods to measure emotions in learning were using newly generated data approaches:

- Quantitative instruments – the self-reporting tools that are designed and validated for measuring emotions. They have been widely used for understanding learner's emotions in blended and online learning. For example, Sarsar and Kisla (2016) developed a 21-item survey comprise of 2 subfactors which are "Giving Emotions" and "Receiving Emotions" to understand the emotional exchanges in online learning.

- Offline interviews and purposeful online conversations – are often related to qualitative researches. However, this approach may not be ideal in large groups of learners. This approach also might be used as a part of mixed-method research in quantitative studies. Risquez and Sanchez-Garcia (2012) for example, used online peer mentoring conversations as a textual data to analyse emotional experiences.

- Wellbeing word cloud – a dynamic visualizations of learners' self-reported feelings based on the words like "overwhelmed", "tired", or "stress" as part of an early alert. Alternatively, simple emoticons of student's experience could be collected as well. For example, Nelson and Creagh (2013) reported that University of New England (UNE) in the Early Alert Program developed an Automated Wellness Engine (AWE) in 2010 to collect data and detect students who may be at potential of disengagement and demoralisation.

- Intelligent tutoring systems, agent engines and avatars, have been used to monitor students' cognitive and recognize emotional states and adjusts its replies based on these human characteristics. The on-screen agent or avatars responds to words, tone, facial expressions, and gestures of the learner. For example, Ahmed, Tang, Ahmad, and Ahmad (2013) installed an agent-based emotion engine for analysing student emotions while appraising lecturers.

Emotional Presence and Community of Inquiry

The researchers have made extensive use of the Community of Inquiry theoretical framework as a tool for creating a meaningful educational experience in online learning. Garrison, Anderson, and Archer (2000) pioneered the Community of Inquiry (CoI) framework. Tolu (2013) argued that this framework has been shown to be an important framework for online teaching and conducting online education studies because it emphasises the importance of creating an effective learning environment in which students feel a bond with other learners and the teacher and participate in well-designed collaborative learning activities because it is based on a collaborative and socio-constructivist approach. This CoI framework mainly consists of three elements which are cognitive presence, social presence, and teaching presence. At first, the emotional expressions category is part of the social presence categories. However, previous studies have shown that there is a need for the addition of an element of emotional presence within the original CoI framework (Cleveland-innes & Campbell, 2012; Stenbom et al., 2016; Sarsar & Kisla, 2016; Parker, 2021).

Cleveland-Innes and Campbell (2012) were the first who introduced and suggested a fourth distinct presence in the current Community of Inquiry framework, and defined emotional presence as "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". They strongly believed and found that emotions existed in the cognitive presence, social presence, and teaching presence. Given by the points as in Rienties and Rivers (2014) article, they emphasized that emotions can emerge at any point during the learning process, in any of the four presence areas where the emotional presence has a diverse effect on cognitive presence, social presence, and teaching presence, and might result in entirely different, even conflicting emotions for different students.
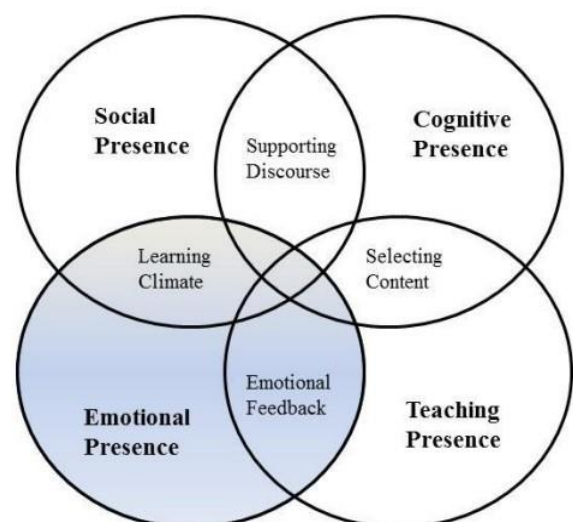
Figure 1. Emotional presence is added to the original Community of Inquiry (adapted from Stenbom, Cleveland-Innes, & Hrastinski, 2014)

Study on particular emotional presence was then continued by Stenbom et al. (2016) and proposed 3

categories or components in emotional presence element as presented in Table 1.

Table 1. Emotional presence elements

Components	Description
Activity emotion	the continuing conversation's process and content
Outcome emotion	the teaching session's expectation or outcome value
Directed affectiveness	the acknowledgement and exchange of emotions between two people in a relationship

In the study, they defined the activity emotion as "ongoing process and content of the conversation", outcome emotion as "the expectancy or outcome value of the coaching session", and directed affectiveness as "the recognition and sharing of emotions or moods between the two individuals in the relationship". They also discovered that emotional presence can be measured in addition to social presence. More and more research on emotional presence supports the need to supplement the CoI framework with an emotional presence component. For example, Sarsar and Kisla (2016) created a survey in their study that included a "Giving Emotions" and "Receiving Emotions" category to help instructors better understand their students' emotional statements. They are adamant that by understanding students' feelings, a strong communication between students and instructors can be established, and students will feel closer, safer, and more at ease with their instructors.

Majeski, Stover, and Valais (2018), on the other hand, conceptualised emotional presence in terms of emotional intelligence because it encourages a much larger role for emotional presence in learning and welcomes emotions in the learning process to a greater extent. They argued that the role of emotional presence in learning extends beyond the original CoI framework's focus on emotional expressions and includes motivating and affective experiential factors such as openness and self-efficacy. A study conducted by Jiang and Koo (2020) discovered that emotional presence, despite being rated lower than cognitive, social, and teaching presence, was a good predictor of students' online learning contentment on its own. The ability of the instructor to connect and express emotional presence influences learner emotion, enthusiasm, behaviour, and ability to learn. In online learning environments, an online educator can use emotional presence to reduce learner isolation as well as the perceived distance and proximity between students and instructors (Parker, 2021).

Discussion and Implication of Emotional Presence in Online Learning Environment

Cleveland-Innes and Campbell (2012) asserted that knowledge about the role of emotion in online learning is still limited. Positive and negative emotions can coexist in online learning. When attempting to increase positive emotions and decrease negativity, instructors must be aware of different students' emotional responses and pay attention to their emotional needs (Jiang & Koo, 2020). If students feel neglected during the learning process because their emotional needs are not met by teachers or learning environments, the consequences can be negative, as they may become unmotivated and lose interest in their studies.

Because emotion has a profound effect on human cognitive functions such as perception, attention, learning, memory, reasoning, and problem-solving (Tyng, Amin, Saad, & Malik, 2017), teachers and educators cannot afford to ignore students' open displays of emotion during the teaching and learning process. However, Trezise (2017) asserted that when it comes to improving students' learning and emotional conditions, education research frequently avoids or neutralises emotions. Trezise and Reeve (2014) discovered that the relationship between cognition and emotion can shift in a short period of time, and cognition and emotion levels predict change and stability, indicating that emotion has a significant impact on cognitive states. Meanwhile, in order to implement more effective emotional elements, the characteristics of learners and their academic needs should be carefully examined (Jiang & Koo, 2020).

A study that assessed recall and recognition for emotionally positive, negative, and neutral words to investigate the effects of emotional content on explicit verbal memory found that emotion significantly influences memory performance and that both positive and negative words were remembered more effectively than neutral words (Khairudin et al., 2012). Furthermore, in a recognition versus recall test, emotional words were remembered better. As a result, instructor roles are critical in online learning to ensure that emotional exchanges in text-based communications are positive.

Assessments of student's emotion may be varied, but a survey instrument and content analysis are common recently. However, the aim is almost similar. Mainly the purpose of emotional presence researches in online learning is to cater the needs to reassess the effectiveness of online learning in student's learning journey context, as emotional presence can derive other successful factors such as a positive and active engagement, that contribute to the success of a student.

Conclusion

In conclusion, emotional presence connects people through technology. As it manifests genuine and caring human characteristics, emotional presence has been empirically demonstrated to play a critical role in online learning by humanising the online learning

experience (Parker, 2021). From the review of the literature, it is obvious that emotional presence is exists in online learning environments which is beyond and outside social presence context, and the importance of the emotional presence in teaching and learning online is very impactful in order to provide a better learning experience among the students. Other than teaching presence, online teachers or instructors should be able to recognize and identify the emotions triggered by the students during online learning sessions to maximize the students' level of learning for better cognitive stages, motivation states, and even the performance of academic achievement.

Acknowledgement

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