

Emotional Presence and Mobile Learning: Learner-driven Responses in a Wireless World

*Martha Cleveland-Innes, Mohamed Ally, Norine Wark, Athabasca
University, Tak Fung, University of Calgary, Canada*

Abstract

This study examines the use of mobile devices among online graduate students, and what effect, if any, this use has on emotional presence. We suggest that emotion exists as part of the online experience, just as it does in all human experience. The intensity of graduate study and the benefit of increased interaction through online communities may be a catalyst for both increased use of mobile communication devices to support learning and a stimulus for emotion. Results demonstrate that half the online graduate students in this study use mobile devices in support of their learning. Emotional presence does exist for online graduate students but it is not influenced by mobile device use. There is a significant gender difference in the measurement of emotional presence.

Introduction

Citizens around the world are increasingly using mobile technology to learn and to complete everyday tasks. In some countries, citizens do not have computers but they have tablets and mobile phones. The number of mobile subscriptions will reach the seven billion mark in 2013 which will be higher than the human population [31]. As smart phones and tablets become more use-friendly and powerful, they will replace the desktop and notebook computers. At the same time, mobile communication devices are used by students in higher education (Ally & Stauffer, 2008; Kim et al., 2006; Goh & Kinshuk, 2006), and particularly graduate students studying online. Highly portable mobile devices, such as smart phones and mobile phones, provide students with the opportunity to access online learning sites at any place and any time, greatly expanding the boundaries of when and where learning can take place. However, there has been little systematic inquiry into the role of mobile communication technology as learning tools in online delivery (Dearnley et al., 2009). Insight into the current use of mobile devices as tools for online learning allows educators to better understand how users of mobile devices can engage within an online learning community. Additionally, this contributes to current understanding of how the use of mobile devices fits into online learning as conceptualized in the online Community of Inquiry model. This research examines:

1. the extent of mobile device use to support learning in a sample of online graduate students and
2. the relationship between mobile device use on the emergence of a fourth type of online presence for learning: emotional presence (Garrison et al., 2000; Cleveland-Innes & Campbell, 2012).

Literature review

There is limited research on emotional presence in online and mobile learning. Cleveland-Innes and Campbell (Cleveland-Innes & Campbell, 2012) reported that emotional presence may exist as a fundamental element in an online community of inquiry and suggested that emotional presence may co-exist with social presence. Angelaki and Mavroidis (2013) investigated the role of communication and social presence in distance learning environments and how they impact the emotions of learners. Results indicated that when communicated with tutors, positive emotions increase while negative emotions decrease. The majority of students reported that social presence improves communication which resulted in positive emotions. Based

on these results, it appears that communication and social presence resulted in increased emotional presence.

Few studies have focused on the use of mobile communication devices as learning tools. A recent systematic review of literature found just 44 studies directly concerned with the use of such devices in an educational setting (Cheung & Hew, 2009). There is very little known about the use of mobile internet devices in place-based or virtual graduate-level programs; “one consequence of rapid technological development is that (a) theoretical framework for mobile learning has not yet been established” (Peng et al., 2009, p.172). Sound research adds knowledge onto the edges of current theories, models and premises in light of changing contexts and new technologies for learning.

The Community of Inquiry (CoI) model has been well-researched in reference to online learning, but is only now being applied to the extensions of online learning, such as mobile learning. The CoI framework provides a process-oriented, comprehensive theoretical model that can inform both research in online learning and the practice of online instruction. It assumes that effective online learning requires the development of a community (Rovai, 2002; Thompson & MacDonald, 2005; Shea, 2006) supporting meaningful inquiry and deep learning.

The model views community as something that emerges in support of online learning. It emerges in the relationship between three elements: social presence, teaching presence, and cognitive presence. Social presence is defined as the degree to which learners feel socially and emotionally connected with others in an online environment; cognitive presence describes the extent to which learners are able to construct and confirm meaning through sustained reflection and discourse. The central organizing element is teaching presence: the design, facilitation, and, most importantly the direction of cognitive and social processes for the realization of personally meaningful and educationally worthwhile learning outcomes. The CoI framework has been under scrutiny for almost a decade and has seen many published works from its original presentation by Garrison, Anderson and Archer (2001), to more recent validations of its premises (Bangert, 2009; Shea & Bidjerano, 2009; Akyol & Garrison, 2008), suggesting that it provides a process-oriented, comprehensive theoretical model that can inform both research in online learning and the practice of online instruction. It is this model that guides our work to understand the place of mobile communication devices in support of a formal online learning experience. From this point of departure, we consider how this model can support our understanding of online

graduate study, the added use of mobile devices and the emotional presence that may exist in the combination of all three experiences.

According to O'Reagan (2003) the transition to online learning, and so too mobile learning, provides the opportunity to test assumptions about emotion embedded in our practice, building on the strands of research regarding emotion and the human experience (Barbalet, 2002; Plutchick, 2003), emotion and cognition (Damasio, 2003; Dirks, 2008) and, more recently, emotion and learning. "In recent years, there has been a growing interest in the role of emotions in academic settings, especially in how emotions shape student engagement and learning" (Linnenbrink-Garcia & Pekrun, 2011, p. 1). Educational psychology has long considered achievement motivation and education performance to be related to emotion (Weiner, 1985; Artino, 2009; Artino & Stephens, 2006). Callahan called for educators who espouse critical theory to "manage the emotions in their classrooms actively" (Callahan, 2004, p.82). He pointed out that "the very praxis of critical theory relies on emotion as its catalyst" (p.75).

Lipman (2003) explicitly wrote about emotion while describing learning through a community of inquiry. For Lipman, a community of inquiry is "thoroughly social and communal; a method for integrating emotive experience, mental acts, thinking skills, and informal fallacies into a concerted approach to the improvement of reasoning and judgment" (p.18). The application of this same model in online learning by Garrison, Anderson and Archer (2000) identifies emotional expression as part of being socially present online. The possibility of an expanded role for emotional presence in online graduate learning is central to this research.

In an inquiry-based, graduate-level online learning environment, student self-managed exploration is more prevalent than direct instruction. Graduate study itself implies the development of self-managed learning and knowledge development. Rather than expecting to be spoon-fed knowledge and provided with answers to challenging questions, we expect that graduate students studying online are i) more likely to use mobile devices to self-manage and enhance their learning and ii) that the intensity of self-management and advanced level study at the graduate level may intensify emotional presence. Based on this assessment of the characteristics of online graduate study, we anticipate that:

1. Students in this sample will use mobile devices in support of their learning and
2. Those using mobile devices will experience greater emotional presence.

Research method and data collection

These predictions were tested as part of a larger cross-sectional mixed-methods research study of online learning and the use of mobile communication devices. The research reported in this article employed a quantitative survey design, using a validated instrument measuring the four presences of a community of inquiry, controlling for the use of mobile devices, the use of mobile devices for learning, and the demographic variables age and gender. The unit of analysis was the individual student and the time-frame was a single snap-shot assessment.

Self-administered online questionnaires were received from a purposeful sample of online graduate students studying in multiple programs at a uni-modal distance and online university. Respondents were recruited via email invitation, with a follow-up reminder and final invitation sent in seven to ten day intervals to non-responders. This sampling yielded an N of 406 students from 30 courses over three consecutive semesters. The response rate averages to 29 % over all semesters.

Data analysis

Initial statistical analysis using SPSS version 20 provided frequency and descriptive data to allow for data overview and cleaning. Principal components analysis was performed on survey responses received from 406 students. Items not loading according to theoretical premises were deleted from the data set before further analysis was completed. T-tests for differences between means and regression analysis of the dependent variable emotional presence were employed for the independent variables of mobile device use, age and gender.

Findings

Table 1 indicates the number and percentage of students who used mobile devices, and those who used such devices for learning. Neither gender ($\chi^2(1)=3.347$, $p=.067$) nor age ($\chi^2(10)=16.084$, $p=.097$) had a statistically significant impact on the use of mobile devices.

Table 1: Mobile device use

	Uses mobile device	Use mobile device for learning
User	309 (76.1 %)	206 (50.7 %)
Non-user	96 (23.6 %)	95 (23.4 %)
Not applicable		96 (23.6 %)
missing	1 (0.2 %)	9 (2.2 %)
Total	406 (100 %)	406 (100 %)

Graduate students in this sample used mobile devices generally and specifically for learning in the course in which they were enrolled at the time of the study. There was no effect of age ($\chi^2(9)=8.398, p=.495$) or gender ($\chi^2(1)=0.185, p=.667$) on use of mobile devices.

A four factor solution identified a theoretical structure in support of Teaching Presence, Social Presence, Cognitive Presence and Emotional Presence. Table 2 identifies item principal components results with Eigen values greater than 1.

Table 2: Four factor principal components analysis with varimax rotation

	1	2	3	4
The instructor helped to focus discussion on relevant issues in a way that helped me to learn.	.752			
Instructor actions reinforced the development of a sense of community among course participants.	.749			
The instructor helped to keep course participants engaged and participating in productive dialogue	.747			
The instructor helped keep the course participants on task in a way that helped me to learn.	.746			
The instructor clearly communicated important course topics.	.741			
The instructor provided feedback in a timely fashion	.728			
The instructor helped to focus discussion on relevant issues in a way that helped me to learn.	.718			
The instructor clearly communicated important course goals.	.699			
The instructor provided feedback that helped me understand my strengths & weaknesses relative to the course's goals and objectives	.679			
The instructor was helpful in identifying areas of agreement and disagreement on course topics that helped me to learn.	.677			
The instructor provided clear instructions on how to participate in course learning activities.	.673			
The instructor clearly communicated important due dates/time frames for learning activities.	.587			
The instructor encouraged course participants to explore new concepts in this course.	.581			
Learning activities helped me construct explanations/solutions.		.629		
I felt motivated to explore content related questions.		.606		

I have developed solutions to course problems that can be applied in practice.		.569		
I can describe ways to test and apply the knowledge created in this course.		.547		
I can apply the knowledge created in this course to my work or other non-class related activities.		.541		
Combining new information helped me answer questions raised in course activities		.629		
Course activities piqued my curiosity.		.606		
Problems posed increased my interest in course issues		.569		
Reflection on course content and discussions helped me understand fundamental concepts in this class.		.547		
Brainstorming and finding relevant information helped me resolve content related questions.		.541		
I utilized a variety of information sources to explore problems posed in this course.		.483		
I felt comfortable interacting with other course participants.			.794	
I felt comfortable conversing through the online medium.			.775	
I felt comfortable participating in the course discussions.			.766	
I felt comfortable disagreeing with other course participants while still maintaining a sense of trust.			.728	
Online discussions help me to develop a sense of collaboration.			.535	
I felt that my point of view was acknowledged by other course participants.			.531	
Getting to know other course participants gave me a sense of belonging in the course.			.477	
I was able to form distinct impressions of some course participants.			.396	
Emotion was expressed when connecting with other students.				.776
I found myself responding emotionally about ideas or learning activities in this course.				.626
Expressing emotion in relation to expressing ideas was acceptable in this course.				.594
The instructor demonstrated emotion in online presentations and/or discussions.				.559

A four-factor principal components analysis with varimax rotation yielded a matrix well-aligned with the theoretical model proposed. The original three factors representing teaching, social and cognitive presence had a 94 % agreement with the original solution. Teaching presence included all items proposed to measure the underlying activities of teaching presence. Social presence was missing one item normally found in the solution identifying activities of social presence: *Online or web-based communication is an excellent medium for social interaction*. This item loaded with emotional presence. Cognitive presence was missing one item normally found in the solution identifying activities of cognitive presence: *Discussing course content with my classmates was valuable in helping me appreciate different perspectives*. This item loaded with social presence. The item: *The instructor acknowledged emotion expressed*

by students loaded with teaching presence, not emotional presence as proposed. The item: *I felt comfortable expressing emotion through the online medium* loaded with social presence, not emotional presence, as proposed. All other measurement items loaded as expected (Factor analysis table available on request and will be included in full article). Results indicated 90 % agreement with the theorized measures of four presences. Items that did not load as expected were removed from further analysis and are not represented in Table 2.

Hierarchical regression analysis identified a significant gender (female as the reference, $\beta=-.101$, $p=.045$) effect on emotional presence, when controlling for age ($\beta=-.017$, $p=.739$) and use of mobile device ($\beta=.025$, $p=.625$); females scored statistical significant higher on emotional presence than did males.

Discussion

Our first objective was to verify that this sample of online learners responded to elements of presence in similar ways to students in past research (Arbaugh et al., 2009; Cleveland-Innes & Campbell, 2012). Results of principal components analysis indicated 90 % agreement with the theorized measures of four presences. Items that did not load as expected were removed from further analysis.

It was interesting to note that two emotional presence items loaded with two other presences. The item: *The instructor acknowledged emotion expressed by students* loaded with teaching presence. This is not surprising, given the emphasis that the item places on actions of the instructor. The item: *I felt comfortable expressing emotion through the online medium* loaded with social presence, not emotional presence. It seems reasonable that, as there are overlaps among the other three presences, emotional presence will also overlap with the other presences. One item from social presence loaded with factor four and items designed to measure emotional presence. This item: *Online or web-based communication is an excellent medium for social interaction* is theoretically attributed to *Affective Expression*, one of the sub-scales in the Community of Inquiry model. This is worth noting, and warrants further consideration of the relationship between affective expression and emotional presence.

While the majority of students said they used mobile communication devices, only one-half of students in the total sample used these devices in support of their learning. There was no relationship between mobile device use and age, gender or emotional presence. There was, however, a significant relationship between gender and

emotional presence; females scored higher on emotional presence items than did males.

Conclusions

The majority of online graduate students, as represented by this sample, use mobile devices. Just over one-half use mobile devices in support of their formal learning. Emotional presence scores do not vary by mobile device use, whether the student was identified as a general user, or one who uses their device specifically for learning. However, the individual influence of gender on emotional presence is significant. This result is the same when controlling for mobile device use and age; gender has an impact on emotional presence scores regardless of age of student or type of mobile device use.

Results from the other three presences, in combination with emotional presence, show a change in scores based on the use of mobile devices for learning, but not for general mobile device use. These results are beyond the scope of this paper, but will be further explored and reported. Evidence from this preliminary exploration of emotional presence and use of mobile devices confirms the existence of emotional presence as a separate element in the online and mobile experience, with a significant gender effect on emotional presence.

Strategies to make use of the communication capabilities should be utilized to increase communication from anywhere so that learners can form community of learners. Designers of mobile learning materials should include strategies to allow learners to interact with each other and with the tutor so that their social presence has a high likelihood of emerging; this interaction effect may result in higher levels of emotional presence.

As communication with mobile technology shifts from text-based communication to verbal communication, research should be conducted on how text-based communication and verbal communication impact emotional presence. Research should also look at gender differences of text-based and verbal communication and emotional presence. The context in which students learn may affect the expression of emotional. With mobile technology, people can learn from any convenient location; this could impact their emotional and social presence. Research is needed to determine how learning in different contexts (classroom, workplace, home) impact social and emotional presence.

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