

2019

# Examining Social, Cognitive and Teaching Presences in an Online Teacher Development Course Using WhatsApp and Community of Inquiry

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## Recommended Citation

Gunter, Glenda A.; Braga, Junia de Carvalho Fidelis Braga F.; and Reeves, Jennifer L. (2019) "Examining Social, Cognitive and Teaching Presences in an Online Teacher Development Course Using WhatsApp and Community of Inquiry," *FDLA Journal*: Vol. 4 , Article 13.

Available at: <https://nsuworks.nova.edu/fdla-journal/vol4/iss1/13>

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## Introduction

Advancements in mobile digital technologies have raised the interest of researchers and educators for their potential for educational purposes (Crompton, 2013; Gunter & Braga, 2018; Gunter & Reeves, 2018; Kukulska-Hulme, 2015; Pegrum, 2014; Pegrum, Huwitt, & Striepe, 2013), especially WhatsApp, a Mobile Instant Messaging (MIM) application that has gained popularity as a communication medium. Although the potential of this application for teaching and learning has been recognized by studies in the field of education in different areas, further research should be conducted in order to investigate whether WhatsApp is appropriate to accommodate interactions of higher-order thinking in initiatives designed for discussions and peer collaboration.

The study reported in this paper sought to address this issue by answer the following questions based on the Community of Inquiry (COI) model (Garrison, Anderson, & Archer, 2000): (a) How often do students express cognitive, teacher, and social presence during online discussions via WhatsApp? and (b) When does cognitive, teacher, and social presence occur most often during online discussions via WhatsApp?

According Anderson (2017), the COI “model has shown itself to be popular as a model to support research and course development not only within the online conferencing context in which it evolved, but also with new technologies as they have emerged” (Integrating the New Technologies, para. 1). As WhatsApp counts on features that can foster online interactions, identifying social, cognitive, and teaching presences in an educational experience can contribute to discussions on the potential of this mobile application for accommodating teaching and learning initiatives.

## Whatsapp: Features and Integration in Teacher Education

WhatsApp, available in smartphones since 2009, gained popularity due to its multitude of features and is used by over one billion users in 180 countries (WhatsApp, 2015). Among its many features, it enables group and individual written communication via text message, as well as oral communication via voice message. One can also share videos and PDF files, in addition to allowing voice and video calls.

WhatsApp has been used by some researchers as a social space for educational mediation and interaction (Braga, Correa Jr., & Martins, 2017; Braga, Correa Jr., & Racilan, 2017; Gunter & Braga, 2018a). Rosenberg and Asterhan (2018) claim that WhatsApp counts on features of social network technologies (SNTs). For the authors, “SNTs encompass a wide variety of web-based and mobile applications that allow individuals to create, engage with, and share

content in digital environments through multi-way communication” (p.206) and can be used as spaces for educational initiatives. Relying on the discussions of Friedman and Friedman (2013), Rosenberg and Asterhan (2018) assert that SNTs’ pillars can be summarized by the 5 C’s: communication, collaboration, community, creativity, and convergence in a way that “SNT-based teacher-student communication complements and sometimes even replaces more traditional communication channels, such as face-to-face, email or school-supported learning management systems (LMSs)” (p. 206). Other studies such as Braga, Gomes Jr., and Martins (2017); Braga, Gomes Jr., and Racilan (2017); and Gunter and Braga (2018) corroborate the idea that WhatsApp as a communication medium contemplate these pillars of social media, although the focus of these studies were not to discuss social media per se, but the many pedagogical possibilities of this application.

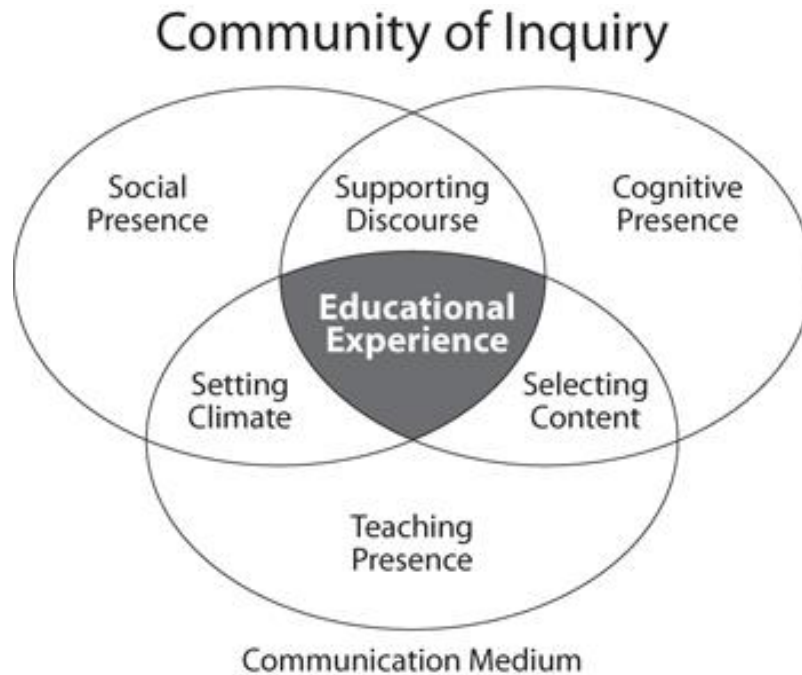
Royle, Stager and Traxler (2014) also claim that the use of mobile devices and applications for teacher development can be seen as a fecund path for teacher development initiatives. For the authors, the virtual learning environment or computer-assisted learning (CAL) packages have usually been chosen by the educational institution. The authors claim that the nature of the current mobile technology is social and at the same time personal, popular, not institutional, pervasive, and ubiquitous. These specificities of mobile devices expand the users’ range of action and thought. Using mobiles to develop quality educators is increasingly instinctive in that learners can intuitively move between content and context” (p. 31).

In this line, Kukulska-Hulme (2015) points out mobile devices can facilitate teachers’ participation in continuing educational programs as they no longer depend on school labs and face-to-face meetings for their continuing education. Although there are several claims of the benefits of mobile learning for mediation on teacher development, Almeida and Araújo (2013); Crompton (2013); Pegrum, Huwitt, and Striepe (2013); and Royle, Stager, and Traxler (2014) remind us that further research focused on providing teacher education opportunities through mobile digital technologies is still needed.

### **Community of Inquiry (COI) Model**

The Community of Inquiry (CoI) framework created by Garrison, Anderson, and Archer (2000) is frequently used to examine the interactions in the online learning environment that foster student engagement and cognitive learning (Arbaugh et al., 2008; Rath, 2012; Swan & Ice, 2010). The CoI framework examines three presences—teaching presence, social presence, and cognitive presence—which Garrison, Anderson, and Archer (2000) put forth as required elements for a “successful higher educational experience” (p. 87). The CoI framework examines

the interaction among these three presences and hypothesizes that the constructs of teaching and social presence have a significant influence on the construct of cognitive presence, and that teaching presence also influences social presence (see Figure 1).



*Figure 1.* COI Framework. Reprinted with permission from Garrison.

Garrison, Anderson, and Archer (2000) created the framework originally to examine the interactions that could promote cognitive learning and engagement of students when learning in online learning environments. The three fundamental elements in the development of the CoI framework, inspired by the research of Dewey (1933), were cognitive presence, teaching presence, and social presence, which attempt to serve as a tool to investigate the quality of the learning process in online environments. Gunter (2007) found four interactions that could be developed to increase student motivation in online learning environments, namely: teacher-student, student-student, student-content, and student-to-computer.

Based on Garrison et al.'s (2000) terms, cognitive presence was defined as "...the extent to which the participants in any particular configuration of a community of inquiry are able to construct meaning through sustained communication" (p. 4). The research reveals that the second element, teaching presence, consists of two general functions in the educational experience: (a)

instructional strategies usually developed by the instructor; and (b) facilitation, which is where the students and the instructor share the learning process. The instructor is considered a *guide on the side*. The last element, referred to as social presence, is defined as “the ability of learners to project themselves socially and emotionally in a community of inquiry” (Garrison et al., 2000, p. 2). While this definition embodies the affective and social characteristics of social presence, it lacks the cohesive features embodied in the concepts of a learning community.

For this reason, we adopted the expanded definition proposed by Garrison (2006), for whom social presence is “the ability to project one’s self and establish purposeful relationships” (p. 2). The main function of social presence in Garrison et al. (2000) is to support cognitive objectives through its ability to instigate, sustain, and support critical thinking within a community of learners.

As online education has increased, there is a world of available literature that focuses on recommendations for best practices in online learning. Some researchers suggest that online learning should provide more opportunities for learner-to-learner interaction. This has created a need for additional research to focus on the unique and different interaction of the learner through a variety of strategies. Along with business and industry, institutions of higher learning are looking for more opportunities to create experiential learning through various technologies by creating more social presence in the various instructional strategies.

## Methods

In this quantitative study, 38 teachers completed an 8-week continuing education course on the use of mobile devices, with a focus on discussing and reflecting on the use of mobile devices in language learning contexts, as well as creating materials on other free mobile apps. Although the tasks were designed to be posted on WhatsApp weekly, some of them lasted longer due to participants’ interest in the discussions. These tasks are briefly presented in Table 1.

Table 1

### *Tasks During the Course*

Task	Description	Topics for discussion
1	Introducing yourself by using a selfie. Using smartphones in education.	Getting to know the group participants. Brainstorming the potential and limitation of the pedagogical use of smartphones for language learning.
2	Using the genre selfie	Using the genre selfie pedagogically,

	pedagogically.	including discussing critically its use in social media.
3	Answering a <i>Quiz</i> about the features of <i>WhatsApp</i> .	Learning about the different features of WhatsApp and how they can contribute to online interactions. Discussion on the use of mobile devices in the classroom.
4	<i>Creating Memes</i> .	Discussing multimodal texts and how memes can be integrated in the classroom.
5	Identifying Fake News.	Discussing digital literacy skills, especially critically reading media that circulate in social media.
6	Using Emojis in online interaction.	Discussing the language of emojis.
7	Utilizing a WhatsApp GPS to make reviews about places.	Discussing how geolocation can be used pedagogically
8	Creating a cyber poem.	Talking about the features of a cyber poem and how to integrate this genre into the classroom.
	Wrapping up the course.	Brainstorming suggestions for future mobile experience.

The teacher development experience briefly described here is part of a project from the School of Letters of a public university in Brazil. The participants, from different parts of Brazil, including rural areas, were teachers of Portuguese in middle and high schools. The course was divulged via Facebook by the organizers of the initiative, and the teachers voluntarily signed up.

The 1,670 interactions that occurred during this course were blind-coded under Garrison, Archer, and Anderson's (2000) categories so that social, cognitive, and teacher presences could be identified. The coding was done by two researchers, one of them a co-author of this article. In order to secure the coding process, the first 100 interactions were validated by the coders so as to avoid deviation. At the end of the process, the researchers compared results and discussed 30 items that showed divergence. Each interaction was coded to reflect the specific presence indicator (see Table 2).

Table 2

*Community of Inquiry Coding Template*

<i>Elements</i>	<i>Categories</i>	<i>Indicators (examples only)</i>
Cognitive Presence	Triggering Event	Sense of puzzlement
	Exploration	Information exchange
	Integration	Connecting ideas
	Resolution	Apply new ideas
Social Presence	Emotional Expression	Emotions
	Open Communication	Risk-free expression
	Group Cohesion	Encouraging collaboration
Teaching Presence	Instructional Management	Defining and initiating discussion topics
	Building Understanding	Sharing personal meaning
	Direct Instruction	Focusing discussion

*Note:* Reprinted with permission from Garrison.

**Data Analysis and Findings**

In order to answer the research questions, the 1,670 coded interactions were expanded to reflect individual occurrences of each type of presence. For example, some codes had both Exploration and Emotional Expression occur in the single interaction. In order to accurately reflect how often students express each type of presence, the coded interactions had to be duplicated in these situations to reflect each individual occurrence. This resulted in 2,040 unique occurrences. Frequencies were conducted on each occurrence (see Table 3) to determine how often students express cognitive, teacher, and social presence during online discussions via WhatsApp. Results revealed that students expressed Emotional Expression most frequently ( $n = 886$  [43.4%]), followed by Open Communication ( $n = 424$  [20.8%]), Group Cohesion ( $n = 228$  [11.2%]), and Exploration ( $n = 212$  [10.4%]).

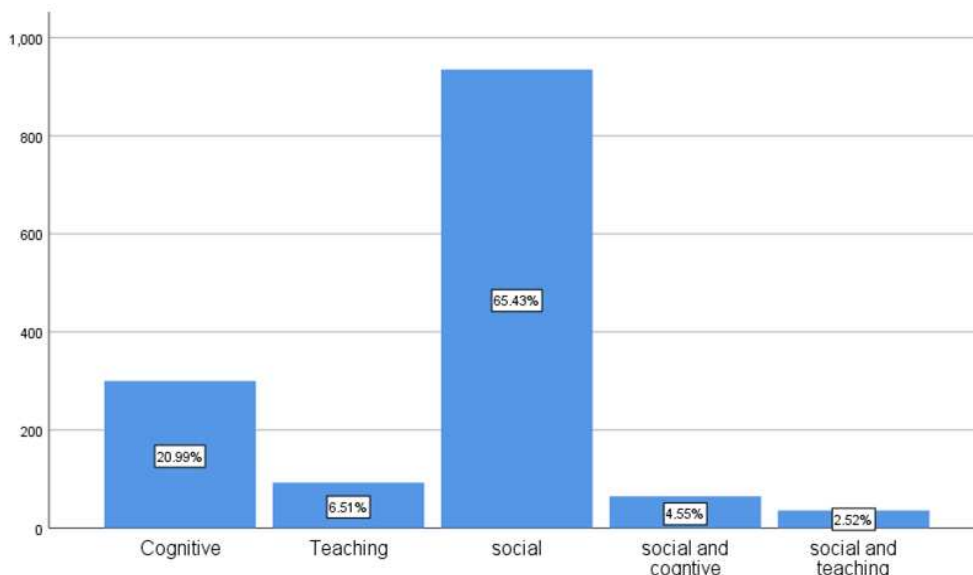
Table 3

*Frequency of Presence Category for WhatsApp Interactions*

		Frequency	Percent	Valid Percent	Cumulative Percent	
Valid	CT1 Triggering Event	6	.2	.3	.3	
	CE2 Exploration	212	8.5	10.4	10.7	
	CI3 Integration	130	5.2	6.4	17.1	
	CR4 Resolution	25	1.0	1.2	18.3	
	TI5 Instructional Management	33	1.3	1.6	19.9	
	TB6 Building Understanding	93	3.7	4.6	24.5	
	TD7 Direct Instruction	3	.1	.1	24.6	
	SPE8 Emotional Expression Emotions	449	18.1	22.0	46.6	
	SPO9 Open Communication	424	17.1	20.8	67.4	
	SPG10 Group Cohesion	228	9.2	11.2	78.6	
	SPEM 11 Emojis	437	17.6	21.4	100.0	
	Total	2040	82.2	100.0		
	Missing	System	442	17.8		
	Total		2482	100.0		

Each occurrence was then grouped into the broader categories of cognitive, teacher and social presence, where social presence ( $n = 1,538$  [75.4%]) was expressed most often, followed by cognitive presence ( $n = 373$  [18.3%]), and teaching presence ( $n = 129$  [6.3%]). In order to look at the combinations of presences that occurred, the original 1,670 coded interactions were analyzed and are shown in Figure 2. Social presence occurred most frequently ( $n = 935$  [65.4%]), followed by cognitive presence ( $n = 300$  [21.0%]). Interestingly, the combination of teaching and cognitive presence did not occur.





*Figure 2. Frequency of Presence Types in WhatsApp Interactions*

In order to answer the second research question, when does cognitive, teacher, and social presence occur most often during online discussions via WhatsApp, crosstabs were conducted with presence type and task type (see Table 4 and Figure 3). Cognitive presence, teaching presence, social presence, and the combination of social and teaching presence occurred most often during Task 6 ( $n = 105$  [35%],  $n = 35$  [38%],  $n = 160$  [17%], and  $n = 9$  25%), respectively), during which they were interpreting and creating riddles using emojis only. While the combination of social and cognitive occurred most often during Task 1 ( $n = 14$  [22%]), where they were using selfies to introduce themselves.

Table 4

*Task by Presence Type for WhatsApp Interactions*

	Cognitive	Teaching	social	social and cognitive	social and teaching	Total
task	0	0	3	0	0	3
0	0	0	63	0	0	63
1	23	13	115	14	4	169
2	14	6	42	3	0	65
3	16	10	76	11	2	115
4	27	7	114	8	7	163
5	29	9	124	11	7	180
6	105	35	160	7	9	316
7	45	1	70	4	0	120
8	22	8	86	4	4	124
9	19	4	82	3	3	111
Total	300	93	935	65	36	1429

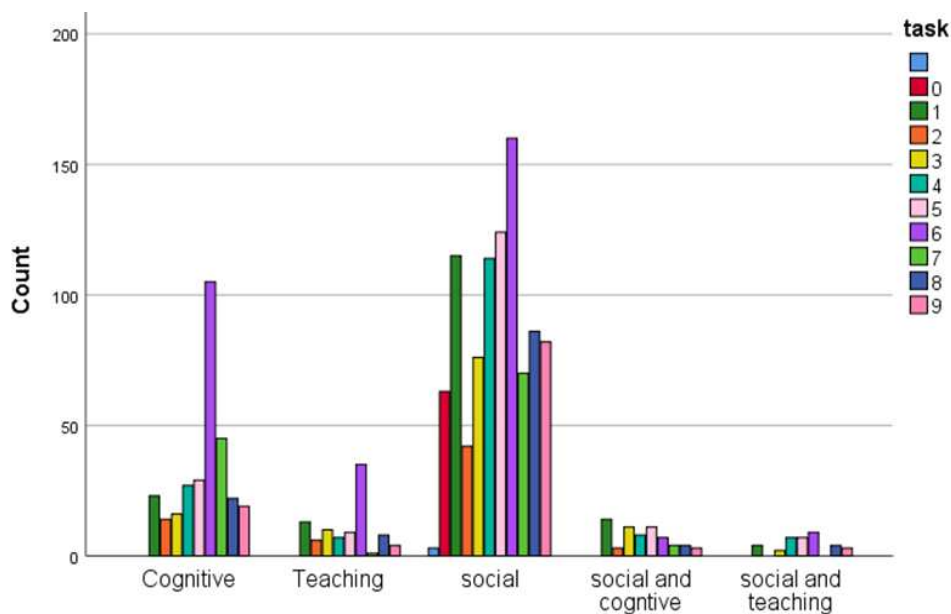


Figure 3. Task by Presence Type for WhatsApp Interactions

**Discussion**

From the analysis of the data, it can be affirmed that WhatsApp is configured as a social space that allows for the use of course designs that seek to promote opportunities for the collaborative construction of knowledge. To that effect, the teachers who participated in the continued education initiative were able to

exchange ideas and express their voices with respect to the potential and the constraint of integrating mobile apps in their situated contexts. The posts that have been coded as *Cognitive Exploration* (CE2), *Cognitive Integration* (CI3) and *Cognitive Resolution* (CR4) seem to bear these issues out considering that the indicators of these categories, according to the CoI model, have to do with exchanging information, connecting ideas, and applying new ideas, as can be seen in Table 2.

As the nature of the course offered to the teachers was underpinned by two pillars, namely: (a) learning how to use mobile applications to develop pedagogical material, and (b) presenting suggestions on how to use the teacher-created materials, emojis were extensively used by the participants to provide an immediate response when those materials were shared and to show appreciation to the ideas of how to integrate them in the language classroom before evaluating and discussing them. The high occurrence of emojis increased the occurrences of social presence (see SPEM Emojis in Table 3), considering that in this study, all the emoji occurrences were coded as emotions.

Another point worth underscoring is the number of occurrences of greetings observed in the collected data. Because WhatsApp allows users to send instant messages, it can be observed that many of them that were sent immediately in response to greetings, such as *good morning*, *good evening*, *see you later*, etc. were coded as social presence. The short response time between sending and responding to greetings allowed by the ubiquity of mobile technologies seems to resemble that of face-to-face interactions. Thus, the opportunities to promptly respond to interactions seem to have influenced the number of social presence occurrences, which were also motivated by the feeling of belonging to the community that the teachers created.

A relationship between the occurrence of teaching presence and the proposed course design can also be observed. In this respect, there was a low occurrence rate of teaching presence considering that the course was designed to promote opportunities for the teachers to exchange ideas and create a collective repertoire of materials. This was therefore not a proposal that involved much direct instruction, for example, as its main focus was to promote collaborative interactions among peers. As shown in Table 4, there were only three occurrences of *direct instruction* throughout the course. Most of the segments that fall under the category of teaching presence have been coded under *instructional management* and *building understanding*.

Although the extensive coding done in this study has led to findings that can contribute to the discussions regarding social presence, cognitive presence, and teaching presence in interactions via WhatsApp, it is important to consider other instruments for future studies on the CoI in order to triangulate the results of the findings. It is also worth pointing out that the course took place in Brazil. The

findings, especially those related to the social presence, may therefore vary in other sociocultural settings, considering that Brazilians tend to be more affectionate and sociable as per the findings in Batista and Bonomo (2016) and Resende (2008). Another direction for future studies is to discover the use and meaning of each emoji used by participants to better understand how they fit into CoI.

This study can serve as a starting point to discussions on the role of social, cognitive and teaching presence in the field of mobile learning and also throw light to the design of pedagogical educational experiences that aim at promoting collaborative learning.

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