

## Articles

# Using the Community of Inquiry framework to analyze emojis as an emerging language in an online educational experience via WhatsApp

## *Usando o modelo de Comunidade de Conhecimento para analisar emojis como linguagem emergente em experiências educacionais via WhatsApp*

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### ABSTRACT

*With the ever-growing interest in WhatsApp as a social space to accommodate pedagogical initiatives, the role of emojis as an emergent Internet language in this social space needs to be better understood as mobile technologies have been integrated in education. With that in mind, this paper reports a study that employed an embedded correlational*

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*mixed methods design, and aimed to identify: the emojis used to support cognitive, teaching, and social presences in a teacher education course via WhatsApp; participants' attitudes regarding the use of emojis, and their age and gender relation to this use. The data generated from the interactions of the teachers via WhatsApp were analyzed and discussed based on Garrison et al.'s (1999) Community of Inquiry Model. This conceptual framework identifies crucial elements for successful online educational experiences and assumes learning occurs through the interaction of three core elements: social, cognitive and teaching presences. The findings show that emojis can effectively be used to support teaching, cognitive, and social presences. The high frequency of emojis seem to be both culturally situated and gender related.*

**Keywords:** *Community of Inquiry; emoji usage; mobile learning; WhatsApp.*

## RESUMO

*Com o interesse crescente pelo uso do WhatsApp como espaço social para iniciativas pedagógicas, o papel dos emojis como língua emergente nesse espaço precisa ser melhor entendido considerando a integração de tecnologias móveis na educação. Com isso em mente, este artigo relata um estudo que empregou uma metodologia mista e visou identificar: os emojis usados para apoiar presenças cognitiva, instrucional e social em um curso de formação de professores via WhatsApp; as atitudes dos participantes em relação ao uso de emojis e a relação de idade e gênero com esse uso. Os dados gerados a partir das interações dos professores via WhatsApp foram analisados e discutidos com base no Modelo Comunidade de Conhecimento de Garrison et al. (1999). Essa estrutura conceitual identifica elementos cruciais para experiências educacionais online de sucesso e assume que a aprendizagem ocorre por meio da interação de três elementos centrais: presenças social, cognitiva e instrucional. Os resultados mostram que os emojis podem ser usados com eficácia para apoiar essas presenças. A alta frequência de emojis parece ser culturalmente situada e relacionada ao gênero.*

**Palavras-chave:** *Comunidade de Conhecimento; uso de emoji; aprendizagem móvel; WhatsApp.*

## 1. Introduction

The Internet has transformed the way we communicate. The addition of the Web and digital technologies has spawned the emergence of a language phenomenon in online communication, something genuinely different from other communication modes, which includes – ‘speech + writing + electronically mediated properties’ (Crystal, 2004, p. 48). Initially different types of language appeared in asynchronous communication, such as emoticons (short for emotion icon) to express one’s feelings or mood – :- ) for happy, and :( for sad, today’s technological advances have enabled the creation of emojis, widely used in social media and interactions via SMS, Messenger, and mobile applications like WhatsApp, to express feelings and other forms of meanings.

The term emoji combines Japanese terms and many feel the resemblance to the English words emotion and emoticon is purely coincidental, however, like many words in various languages, there may be connections. The first emoticon, the humble smiley :- ) was used in 1982 in a communication by Dr. Scott Fahlman, a Carnegie Mellon Professor. As we see today the emoticon or emoji has become part of our daily communication. The updated miniature images were designed for use on mobile devices to express emotions in text communication. Their popularity grew quickly and spread around the world as a form of communication and visual cues in the digital culture. Since face-based emojis were created, the library of emojis has grown with the introduction of animals, food, and other pictures (Alshenqeeti, 2016).

As Paiva (2016) points out, informal written language is becoming increasingly multimodal. For Paiva, who identified and analyzed emojis in social media, the use of emojis can be understood as an attempt to convey meaning economically in certain interactions. The creation of emojis, associated with mobile applications and their emoji keyboards, has transformed the way we communicate and interact on Twitter, WhatsApp, Instagram, Facebook, and other social media platforms. There is a growing body of research that is focused on interpreting the uses of emojis in all forms of digital communication modes. Researchers have found that even though many emoji’s look similar, their meaning and interpretation are influenced by individuals’ cultural backgrounds, gender differences, and their own visual characteristics

create a language for communication (Bai, Dan, Mu, & Yang, 2019). Fullwood, Orchard, and Floyd (2013) conducted extensive research on emoji use in Internet chat rooms. They found that all age groups use emoticons for expressing emotions in communication. Their research looked at specific use of emoji's based on gender. They found female participants were more likely to use expressive emoticons more often than male participants and overall were more likely to use emoticons during direct interactions with others.

Since being introduced to the market in 2009, WhatsApp's popularity has continued to grow. If in its infancy the app was primarily used for communication, it has proved to be a tool that can be used to mediate educational experiences. The ubiquitous and mobile nature of the app, coupled with its features for creating and sharing oral, written and multimedia content, replying and forwarding posts has piqued the interest of teachers, especially in the language context, to integrate this tool into teaching and learning.

With the ever-growing usage of WhatsApp as a social medium to entertain pedagogical initiatives, the role of emojis in communication channels needs to be better understood if we are to integrate mobile devices and apps in the educational context. This is important because emojis can yield insights into both the evolution of learning communities in education and the role of non-verbal and multimodal texts in online education experiences via mobile devices.

One of the most influential studies on the quality of online learning was Garrison, Anderson, and Archer's (1999) Community of Inquiry (CoI) Model. Their framework aimed to identify key elements for a successful text-based communication in online courses, with the assumption that learning occurs through the interaction of three core elements: social presence, cognitive presence and teaching presence. Although their study recognized the use of emoticons in forum interactions, identifying the role of emerging languages in educational experiences via mobile devices may contribute to the discussions regarding online communication. Researchers have continued to analyze different forms of communication in online learning using the CoI model (Micsky & Foels, 2019; Rath, 2012).

Drawing on the CoI model, the purpose of this embedded correlational study is threefold: a) discover what types of emojis are used to support cognitive, teaching, and social presences in an 8-week continuing education course on the use of mobile devices and application via WhatsApp; b) determine how participants' attitudes relate to the use of emojis for cognitive, teaching, and social presences during this course; and c) determine how participants' age and gender relate to and potentially explain their emoji use. With this purpose in mind, this paper presents a brief overview of the Community of Inquiry (CoI) Model.

## 2. The Community of Inquiry (CoI)

According to Garrison et al. (1999), "Cognitive presence is a vital element in critical thinking, a process and outcome that is frequently presented as the ostensible goal of all higher education." (p. 93). This presence can be identified in asynchronous written communication when students are exchanging information, connecting ideas, and applying new concepts. According to Garrison et al., cognitive presence is one of the essential elements in the CoI framework that are developed through the connections of the participants to construct meaning through sustained communication.

Social presence is defined by Garrison et al. (1999) as "the ability of participants in a community of inquiry to project themselves socially and emotionally, as 'real' people (i.e., their full personality), through the medium of communication being used" (p. 94). Emotion expressions, risk-free expression, encouraging group cohesion, acknowledging others, and encouraging collaboration are some of the indicators of social presence in online text-based communication as can be seen in Table 1.

An essential characteristic of creating social presence in face-to-face settings is visual cues that individuals express. In online environments, individuals often have never communicated in person, which can create challenges in establishing social presence. Kuehn (1993) and Walther (1994) described ways participants create a connection through the use of emoticons or other symbols to add affective elements in computer-mediated conversations. These resources helped establish

social presence and added emoticons to the online experience (Bai, Dan, Mu, & Yang, 2019).

According to Garrison and Arbaugh (2007), research on the role of student group cohesiveness and interaction in team effectiveness suggests a strong relationship between social presence and learning outcomes. The authors, based on investigations conducted by Molinari (2010), Celani and Collins (2005), and Beuchot and Bullen (2005), also claim that social presence is a foundation for cognitive presence (Whiteside, 2015). Findings in recent studies, such as d'Alessio et al. (2019) and Rolim et al. (2019), also reveal that social presence has strong links with cognitive presence.

Garrison et al. (1999) claim that appropriate cognitive presence and social presence are dependent upon the presence of a teacher whose role includes defining and initiating discussion topics, building understanding, among other things. Based on peer-facilitation techniques, a study by Chen, Lei, and Cheng (2019) revealed that teacher presence may affect the level of cognitive presence in online classes. The intervention of peer facilitators during the course, especially when asking questions of a specific type, affected the level of cognitive presence. For Braga (2007), the facilitation of discussions can also have a distributed character in online educational experiences as course participants may facilitate discussions that involve, for example, encouraging discussions, identifying points of convergence and divergence, and proposing new ideas, a role generally played by a teacher.

As the model has been well received by scholars and educators to evaluate cognitive, social, and teaching presences, and acknowledges different language manifestations such as emoticons, it is our understanding that it can be used to analyze the meaning of emojis in interactions that occur during online educational experiences via WhatsApp.

### **3. Method**

#### *Participants*

The research context was an 8-week continuing education course focusing on the use of mobile devices in language learning. This course,

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part of a project from the School of Letters of a prestigious university in Brazil, was offered to K-12 in-service English teachers from different parts of the country. Due to the high number of teachers enrolled ( $N=227$ ), six groups were formed and mediated simultaneously.

Figure 1 shows the locations of the research participants when they took part in the course.

**Figure 1** – Location of the Participants



*Note.* Created by the authors with pt.batchgeo.com. Retrieved from <https://pt.batchgeo.com/map/dc97f2471e0e465c02cb799b97cb383b>

As can be seen on the map, the highest number of participants are from the South East and the North East regions of the country. It is worth mentioning the potential of mobile applications, especially WhatsApp, to both reach and gather people from different locations. In a continental size country like Brazil, it was possible for people from urban and rural areas to participate in the course on mobile learning.

## *Instrument*

All participants were given a 10-question presurvey prior to beginning the course. The presurvey consisted of four demographic questions (i.e., name, location, age, gender) and six 5-point Likert scale questions on participants' attitudes towards the use of mobile devices for teaching and learning. Upon completion of the 8-week course, participants were given a post survey consisting of three questions on their readiness to use and apply mobile devices for teaching and learning. The pre and post survey questions were selected from the Mobile Learning Survey, originally adapted by Gunter and Reeves (2017) to examine teachers' attitudes towards online professional development embedded with mobile learning. Internal consistency reliability for the attitude questions were acceptable ( $r = .70$  for presurvey items and  $r = .77$  for post survey items (Gunter & Reeves, 2017).

## *Design*

This study employed an embedded correlational mixed methods design. According to Creswell and Plano Clark (2018), an embedded approach is used when both quantitative and qualitative data collection and analysis are combined with a traditional quantitative (or qualitative) approach. In contrast to most mixed methods designs, the purpose is not necessarily to merge the two data sets since they are typically used to answer separate research questions. In the current study, the quantitative data collection and analysis was embedded in qualitative data collection and analysis. For the qualitative data, transcripts were collected from the WhatsApp course and coded based on the CoI framework. Emoji use was analyzed qualitatively using Emoji word clouds with rich participant descriptions to support the main findings. Participants' emoji use was then quantified and correlated with participants' attitudes based on pre and post survey responses. Additionally, participants' age was correlated to their emoji use to determine if age influenced emoji use. Finally, emoji use was compared for male and female participants to determine if gender had a significant impact on participants' emoji use. The following research questions guided this study:

- a) What types of emojis are used to support cognitive, teaching, and social presences in an 8-week continuing education course on the use of mobile devices and application via WhatsApp?
- b) How do participants' attitudes relate to the use of emojis for cognitive, teaching, and social presences during this course via WhatsApp?
- c) How do participants' age and gender relate to and potentially help explain their emoji use?

### *Procedures*

At the beginning of the course all participants were given the presurvey to measure their attitudes towards mobile devices, as well as a demographic questionnaire. The course was then carried out over an 8-week period and mediated via WhatsApp. The tasks relied on the following pillars: i) familiarization with different mobile apps - WhatsApp functions (location, audio, text message etc.), and recognition of genres circulating in mobile platforms - selfies, memes, among others; ii) material development based on the functionalities of mobile devices, such as cameras, GPS, among others; and iii) discussions on approaches that may be incorporated to m-learning. At the end of the 8 weeks all participants were given the post survey to measure their attitudes towards mobile devices.

### *Data Analysis*

Upon completion of the 8-week course, transcripts from each group were downloaded from WhatsApp into an Excel spreadsheet. The written interactions were used as contexts in the analyses of the emojis to help categorize them as instances of cognitive, teaching, or social presence. All emojis used in the interactions in each group were coded, according to the CoI categories and indicators as seen in Table 1. When one or more emojis were used as a single representation in an interaction (i.e., all by itself) the coding was based on the discussion that was taking place the moment it was posted. The coding of the inte-

reactions in the six groups (Group 1- 1962 posts, Group 2 - 1895 posts, Group 3 - 1180 posts, Group 4 -1436 posts, Group 5 -1303 posts, Group 6 - 1492 posts) were then verified by two of the authors of this article.

**Table 1** – Community of Inquiry Coding Template

Elements	Categories	Indicators (examples only)
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.* Retrieved from Garrison et al. (1999, p. 89).

Upon completion of the coding, it was discovered that 117 unique emojis were used by the participants during the 8-week course. In order to answer the first research question and determine the types of emojis used to support cognitive, social, and teaching presence that occurred during the interactions in the course, frequencies were then computed on each emoji type. More specifically, within each group, the number of times each type of emoji was used (e.g., 😊 or 🙌) was counted and summed for each CoI category (e.g., Triggering Event or Emotional Expression). Emoji use for each CoI category was then combined to produce a total count for each CoI element (or presence type; see Table 1). This was done for each of the six groups, and then all six groups were combined to produce the total number. In other words, for each unique emoji, tallies were computed within and across the six groups for each CoI category. Each CoI category was then grouped into the CoI

Element (i.e., cognitive, teaching, or social) to give the total number of times the emoji was used for each presence. Upon completion, a total of 2,079 emojis were used across the groups to represent cognitive, teaching, and social presence during the course. Emoji clouds were created to visually present the data. Additionally, rich descriptions from the text (WhatsApp course interactions) were included to support how the various emojis were used to support each presence.

In order to answer the second research question, how do participants' attitudes relate to their emoji use, Spearman Rho analyses were conducted on participants' posttest scores and emoji use. Unfortunately, only 61 participants completed both the pretest (including the demographic information) and posttest; therefore, the researcher's only examined the emoji use for these 61 participants to answer the second two research questions. To answer the third research question, how do age and gender relate to and help explain emoji use, spearman rho analyses were conducted on age and emoji use and independent samples *t* tests were conducted with gender as the IV and emoji use as the DV.

## 4. Results and Discussion

To determine the types of emojis used to support cognitive, teaching, and social presences, frequency distributions were conducted on each emoji type across all presences. The results are presented in Appendix A. Overall, the most frequently used emojis across all three presences, cognitive, teaching, and social, were the Clapping Hands emoji 🙌 ( $n = 287$  times), the Winking Face emoji 😜 ( $n = 251$  times), Thumbs-Up emoji 👍 ( $n = 139$  times), the Face With Tears of Joy emoji 😂 ( $n = 121$  times), the Smiling Face With Smiling Eyes emoji 😊 ( $n = 120$  times), the Smiling Face emoji 😃 ( $n = 112$  times), the Smiling Face With Smiling Eyes and Hearts emoji 😍 ( $n = 111$  times), and the Rolling On The Floor Laughing emoji 🤣 ( $n = 41$  times; see Appendix A for the frequencies for each type of emoji used by participants).

Table 2 presents the original meaning of the most frequently used emojis found in the interactions during the continuing education course. The meaning of the emojis that were used most frequently in cognitive

presence, teaching presence, and social presence were included in the table. It is important to note that given the large number of emojis used to express social presence, there were other emojis (i.e., 😂:  $n = 77$ ; 😊:  $n = 71$ ; 😄:  $n = 59$ , 😏:  $n = 58$ , 😁:  $n = 56$ ; 😇:  $n = 47$ ) that were used more frequently than the Rolling On The Floor Laughing emoji 🤣, but did not appear as one of the most frequently used emojis for cognitive, teaching, or social presence and therefore was not included in Table 2).

**Table 2** – Description of the Most Frequently Used Emojis by Participants

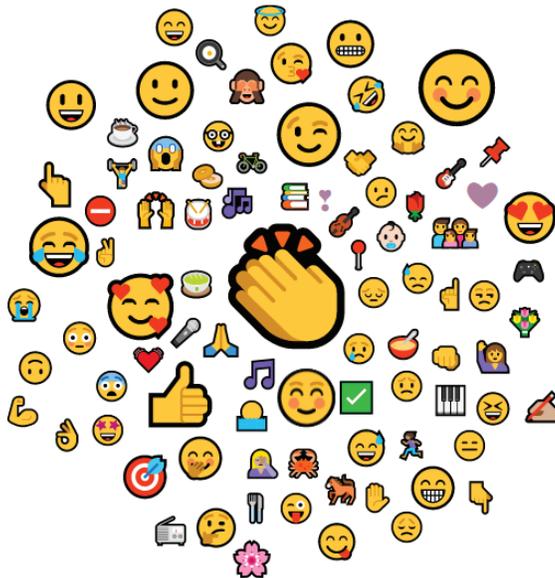
Emoji	Name and description
	<b>Clapping Hands</b> Two hands clapping. Expression of hurray, applause, bravo, very well done or being in agreement.
	<b>Winking Face</b> Facial gesture of winking. Expression of humor, approval, appreciation, and understanding.
	<b>Thumbs-Up</b> Hand with thumb turned up. Stands for approval, agreement and commitment. Can mean well done or liking.
	<b>Face With Tears of Joy</b> Big grin, uplifted eyebrows, and smiling eyes shedding tears. Funny, giggling, pleasing, or something unbelievably humorous that makes us cry laughing.
	<b>Smiling Face With Smiling Eyes</b> Shy and embarrassed grin. The red cheeks are expressing joy. Represents happiness and positivity.
	<b>Smiling Face</b> Shy grin with eyebrows. Communicates a broad range of warm and positive feelings, including satisfaction, gratitude and affection.
	<b>Smiling Face With Smiling Eyes and Hearts</b> Romantic emoji commonly used to express warm fuzzy feelings or uplifted mood. Can also express a feeling of love or being in love.
	<b>Rolling On The Floor Laughing</b> Smiley face laughing out of control. Something is so funny that we roll on the floor. Can represent very interesting and extremely humorous, and entertaining.

*Note.* Adapted descriptions by the authors, source <https://www.emojimeanings.net/>

## Cognitive presence

To determine what type of emojis were used to support cognitive presence, frequency distributions were conducted on all interactions. Results illustrated that for cognitive presence, the Clapping Hands emoji 🙌 was the most frequently used emoji ( $n = 105$  times), followed by Smiling Face With Smiling Eyes emoji 😄 ( $n = 51$  times), Thumbs-Up emoji 👍 ( $n = 47$  times), Smiling Face emoji 😊 ( $n = 47$  times), Smiling Face With Smiling Eyes And Three Hearts emoji 🥰 ( $n = 40$  times), Winking Face emoji 😜 ( $n = 37$  times), Face With Tears of Joy emoji 😂 ( $n = 33$  times), Slightly Smiling Face emoji 😊 ( $n = 71$ ), and Smiling Face with Heart-Eyes emoji 🥰 ( $n = 24$  times; see Appendix A). The data is visually displayed as an emoji cloud in Figure 2. The emoji cloud is a visual of all the types of emojis used; the larger the emoji, the more frequently it was used by participants.

**Figure 2** – Types of Emojis Used to Support Cognitive Presence



*Note.* Word cloud created by the authors on worditout.com. Retrieved from <https://worditout.com/word-cloud/4345794>

As stated in the analysis, the Clapping Hands emoji 🙌 was the most frequently used emoji to support cognitive presence. To understand how emojis were used to support cognitive presence, rich descriptions from the text (i.e., WhatsApp course interactions) are included. Below is an interaction in Group 2 (coded as integration), where this emoji was used by Participant C after his peers inspired him to create his own class materials.

**Participant A:** I would use either selfies or braggies with new classes, as ice-breakers, so they can know each other. But I loved all the ideas people! They're super doable! ❤️

**Participant B:** For sure!

**Participant C:** Those are great ideas. I have never worked with selfies and braggies but now I am looking forward to it! 🙌🙌🙌🙌🙌🙌🙌

**Participant C:** As I work with technical courses, I usually teach Ss who take photography related disciplines. We use their photographs of our city to work descriptions and directions. But now, I'll love to work with the selfies!

🙌🙌🙌🙌🙌🙌🙌🙌

The second example shows a discussion on the use of GPS for pedagogical purposes in Group 3. Participant B adds his ideas to the topic and also gives positive feedback to Participant A's suggestions on how to integrate the GPS in the classroom. Participant B uses both the Smirking Face With Starry Eyes emoji 😄 and the Clapping Hands emoji 🙌 to support cognitive presence. These emojis illustrate the connection of ideas during these discussions.

**Participant A:** "Besides the great ideas already given, I believe we could also try a cross curricular approach, or even a CLIL class, teaching cartography and scale, which are Geography topics, in English. Apps [such as] Google Maps, GPS location and Google Earth would make the experience much more instigating and real. Students could also draw maps and places found in the city on different scales, which would require some artistic and math skills as well."

**Participant B:** "It's possible to include History, art history, biology and others, depending on the project we'd like to develop."

**Participant B:** "😄😄🙌🙌🙌"

**Participant A:** "Of course! They could analyse how things have changed along the years: the streets, traffic signs, buildings' facades, vegetation. The human action affecting urban and rural environments... Even writing production could be explored."

In Group 6, the use of emojis such as *Clapping Hands*, *Smiling Face* and *Thumbs-Up* shows Participant B's appreciation for the discussions on how to raise awareness of fake news in the language classroom as well as his intention to apply these new ideas in class. These were coded as an indicator of the category resolution in CoI.

**Participant A:** "I would talk to students about the importance of checking if they can trust every text they find on the internet or even facebook, instagram or whatsapp groups messages. I'd send them some texts and provide a material which could help them to identify fake news and ask them to analyze those texts.

**Participant B:** "I loved your strategy 🙌🙌🙌"

**Participant B:** "I'd do the same as you. Actually I'll plan a lesson following your idea and I'll share my experience here later. I haven't taught anything about fake news yet, so it's gonna be my first attempt. 😊👍"

Different cognitive manifestations were identified in all six groups throughout the course and appeared to sustain communication during the course, as shown in the examples in Table 3, be they to trigger an event by clarifying any confusions, exploring different experiences and information, integrating ideas from situated contexts throughout the flow of interactions, and incorporating new ideas in their teaching practices.

**Table 3** – Cognitive Manifestations in the Groups

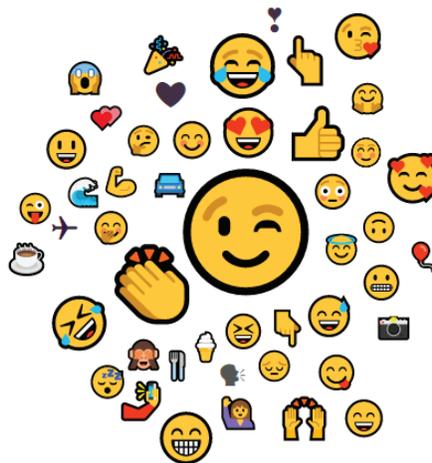
Indicators	Excerpts from course interactions
Sense of puzzle-ment	"Are we going to learn how to make videos like this? Is it possible? 😊"
Information Exchange	"I suppose they love to do It. Compare with us! Everyone here so happy sharing our experience here 😊" (Group 1) "awesome idea 💡. I'll try this out!" (Group 6)
Connecting ideas	"I think that would be cool the students make a tour by the city and take selfies in monuments, interesting places as a presentation of our homeland to a stranger. "Bora" value our culture!❤️" (Group 5) "As I work with technical courses, I usually teach Ss who take photography related disciplines. We use their photographs of our city to work descriptions and directions. But now, I'll love to work with the selfies! 🙌🙌🙌🙌🙌🙌🙌🙌" (Group 2)
Apply new ideas	"In this case, in public School, that some of them didn't have smartphone even internet. What did I do? I print some balloons like a model of smartphone. Then they create a dialogue between them 😊" (Group 1)

The connection of ideas, the exchange of information, and the new ideas to be applied in the language classroom that emerged from these interactions reveal not only evidence of construction of meaning, but also the potential of WhatsApp to mediate educational experiences.

### *Teaching presence*

Frequency distributions were conducted on all interactions to determine what type of emojis were used to support teaching presence. To represent teaching presence, the most frequently used emojis were Winking Face emoji 😜 ( $n = 56$  times), Clapping Hands emoji 🙌 ( $n = 29$  times), Face With Tears of Joy emoji 😂 ( $n = 20$  times), Thumbs-Up emoji 👍 ( $n = 18$  times), Rolling On The Floor Laughing emoji 🤣 ( $n = 14$  times), Beaming Face with Smiling Eyes emoji 😄 ( $n = 13$  times), Smiling Face with Hearts emoji 😍 ( $n = 12$  times), Smiling Face with Heart-Eyes emoji 😘 ( $n = 12$  times), Backhand Index Pointing Up emoji 🙄 ( $n = 12$  times); and Face Blowing a Kiss emoji 😘 ( $n = 10$  times; see Appendix A). The data is visually displayed as an emoji cloud in Figure 3.

**Figure 3** – Types of emojis used to support Teaching Presence



*Note.* Word cloud created by the authors on worditout.com. Retrieved from <https://worditout.com/word-cloud/4346141>

As interactions via WhatsApp are instant and allow on-demand response, teaching presence was manifested not only by the teachers, but also by course participants who were available and who felt comfortable contributing. During the course, the Mobile Phone emoji 📱 was used every time the teachers and tutors interacted with the group. This was a strategy to help course participants identify the teachers' post, tasks, or interventions to build understanding of a type of digital genre. As this emoji served as a pedagogical strategy and did not emerge from the interactions in the course, it was not coded as teaching presence and not analyzed as such.

As shown in the data analyses and in the cloud maps, different types of emojis were identified as teaching presence. The Winking Face emoji 😜 was often used to minimize the impact of interventions such as confirming and understanding a task, encouraging participants' contributions, keeping the focus of discussions on the task, etc. The following example illustrates how this emoji was used to encourage participants' contributions in Group 1. It can also be seen that the Smiling Face emoji 😊 was used to acknowledge participants' contributions.

**Teacher A:** “ 📱 Hi everyone! You have created and shared great memes! If you haven't sent your meme, we are looking forward to it! 😜 ”  
 “Send an audio message describing the meme/GIF you have chosen. It's great to see your comments on your peers' reviews 😊.”  
 “Make sure you write an informative one so that your peers feel like commenting. 😊”

The next example demonstrates that oftentimes the course participants played the role of a teacher in the course. In the following post from Group 3, Participant B even 'copied' the Mobile Phone emoji 📱 used by teachers to suggest apps and articles for the task. B also included the Up Pointing Index emoji 👉 and the Smiling Face emoji 😊 in his posts to encourage his peer to develop the task.

**Participant A:** “Sorry, I don't know how to create memes 😊😜😞 ”  
**Participant B:** “ 📱 \*Meme:\*  
<http://makeameme.org/> <https://imgflip.com/memegenerator> [...]  
 \*Animated GIF:\*  
<https://giphy.com/> [...]  
 When you're finished, copy the 'GIF link' on WhatsApp!\_

Read the article “How-memes can make lessons interesting”

U can use it 🙌

📱 I’ve done it n’ really worked”

As was the case with the discussions on the intertwining of both cognitive and social presence, interactions identified as teaching presence were also marked by the presence of emojis. These emojis facilitated the interventions of both teachers and tutors as well as the participants’ own intervention initiatives.

Teaching and instructional manifestations, although mainly initiated by the teachers and tutors, as seen in Table 4, were also identified in interactions posted by course participants. These manifestations happened during instructional management, meaning construction, and direct instruction.

**Table 4** – Teaching Manifestations in the Groups

Indicators	Excerpts from course interactions
Defining and initiating discussion topics	<p>“I think you have added me to 2 groups 😊 Can I pls stay in just one?” (Group 1) “hi y’all! I’m not a digital game player myself so I think that resources related to entertainment (vernacular) games such as reviews, narratives, walkthrough, etc can be a way to integrate games in the classroom. What do you think of this strategy 😊?” (Tutor’s post in group 4)</p>
Sharing personal meaning	<p>“Participant A: I’ll start teaching about places and giving directions now and you have given me a nice idea to work with my students. This can be done using google maps as well, right? Students can write reviews about places they have gone. Participant B: I had the same idea. 😊” (Group 6) “[participant’s name], I also had the opportunity to work with a deaf student some years ago. Exploring multimodal and digital resources was very effective to engage him with the classes and classmates. I believe going digital with our practice can be a way of real integration and not just creating special and different materials for one student. Nowadays, there are many websites with ideas and activities. I can send you later.” (Tutor’s post in group 1)</p>
Focusing discussion	<p>“Guys, let’s think about what a good review should contain... It is different from a comment.. 😊❤️ check the example on the posts!” (Tutor’s post in group 4) “Make sure you write an informative one so that your peers feel like commenting. 😊” (Tutor’s post in group 5)</p>

Throughout the posts, social presence led participants to feel comfortable playing the role of teacher, something quite positive in a social environment such as WhatsApp, in which the dynamicity and the number of messages often call for a participant available at any time to step up, as can be seen in the excerpts above. Structuring and facilitating class management and instruction shows that social presence plays an important role supporting teaching presence.

### *Social presence*

To determine what type of emojis were used to support social presence, frequency distributions were conducted on all interactions. To support social presence, the most frequently used emoji were the Winking Face emoji 😜 ( $n = 158$  times) and the Clapping Hands emoji 🙌 ( $n = 153$  times), followed by Thumbs-Up emoji 👍 ( $n = 74$  times), Face With Tears of Joy emoji 😂 ( $n = 68$  times), Smiling Face With Smiling Eyes emoji 😊 ( $n = 64$  times), Smiling Face emoji 😄 ( $n = 60$  times), Smiling Face with Hearts emoji 😍 ( $n = 59$  times), Smiling Face with Heart-Eyes emoji 😘 ( $n = 41$  times), Slightly Smiling Face emoji 😊 ( $n = 40$ ), Face Blowing a Kiss emoji 😘 ( $n = 35$  times), Beaming Face with Smiling Eyes emoji 😁 ( $n = 31$  times), and Grinning Face emoji 😄 ( $n = 31$  times; see Appendix A). Please see Figure 4 for a visualization of the emoji cloud.

**Figure 4** – Types of Emojis Used to Support Social Presence



*Note.* Word cloud created on worditout.com.  
Retrieved from <https://worditout.com/word-cloud/4345830>

Social and affective manifestations such as emotion expression, humor, greetings, and acknowledgement of others were identified in all six groups throughout the course and appeared to create a community atmosphere as demonstrated in the examples below.

**Table 5** – Social and Affective Manifestations in the Groups

Indicators	Excerpts from course interactions
Emotion expressions	<p>“After a busy day... a little messed up 😞 I am [participant’s name] and I am part of Taba’s team.” (a tutor’s post in group 4)</p> <p>“I’m answering the activities. 😊” (Group 3)</p> <p>“I guess we first have to fulfill the expectations for the previous task 🙋” (Group 5)</p>
Humor	<p>“I’m feeling like a zombie 🧟♂️! 😞” (a tutor’s post in group 1)</p> <p>“Lucky u it was on this day... 😊 Just kiddin” (Group 3)</p> <p>“Remember! I’m 55 years old 😂😂😂😂😂😂” (Group 1)</p>
Greetings	<p>“Glad to meet you too 😊📖” (Group 3)</p> <p>“Good night to all of you! I’m sleepy. God bless you! See them tomorrow! 😴😴😴😴” (Group 5)</p> <p>“Happy easter, everyone! 🐰😊” (Group 2)</p>
Acknowledging others	<p>“🏆 Congrats for being the first one to post your 🇧🇷🏆👏” (a tutor’s post in group 5)</p> <p>“Thanks [participant’s name]for helping me 👍🙏” (Group 3)</p> <p>“Great presentation!!! 🙌🙌” (Group 1)</p> <p>“U can use it 🙋” (Group 3)</p>
Group cohesion	<p>“We are together 🤝” (Group 3)</p> <p>“Hi, [participant’s name]! I’m glad you’re here, buddy! 😊😊” (a tutor’s post in group 1)</p> <p>“Kicking off the ball. ⚽ Getting ready to start working! A blessed Wednesday for you all! 🙏” (Group 1)</p>

The findings regarding the high number of emojis coded as social presence seem to reveal a trait of the Brazilian culture. Brazilians are locally and internationally known for having a very joyful, affectionate, and friendly nature. Instances of a great number of Red Heart emoji ❤️, Face Throwing a Kiss emoji 😘, and Smiling Face With Smiling Eyes And Three Hearts emoji 😊💗 shown in Figure 4, although more frequent in the interactions coded as social presence, were also identified in the interactions coded as cognitive and teaching presences.

Another point that has contributed to the high frequency of emojis identified as social presence is that WhatsApp is an application that allows almost real time replies as users can answer messages instantly. This feature of WhatsApp may have been used to signal that the participants were following the course of interactions, often using short messages with emojis or only emojis as teachers are always on go. As Pegrum (2014) claims, the essence of mobile learning happens on demand or just in time interactions that are usually combined with brevity and not too much or too little information.

The use of emojis in interactions via WhatsApp seems to corroborate Paiva's (2016) idea that "the increasing use of emojis is an attempt to convey more meaning in a more economical manner in given contexts of interactions. This is the case of emojis that seemed to indicate that participants were following the course of interactions. Moreover, the findings suggest that emojis can also be used to give support to ideas or minimize the impact of some written interactions as shown in the findings.

### *Relating Participants' Attitudes to the Use of Emojis*

In order to determine how participants' attitudes relate to the use of emojis for cognitive, teaching, and social presences, three Spearman Rho analyses were conducted with participants' responses on the post survey ( $N = 61$ ) and emoji use for each of the presences. Results of the Spearman Rho analysis suggested that emoji use in terms of cognitive presence was significantly, positively correlated to participants' attitudes regarding their readiness to use mobile devices in the language classroom ( $r_s = .32, p = .01$ ). In other words, the more ready they are to use mobile devices, the more often they used emojis to support cognitive presence throughout the course. This suggests that the more familiarity participants had with WhatsApp, the more likely they were to use all of its resources, including emojis, to exchange information, connect ideas, and apply new knowledge. However, emoji use in terms of social ( $r_s = .20, p = .12$ ) or teaching presence ( $r_s = -.09, p = .48$ ) failed to correlate to participants' attitudes regarding their readiness to use mobile devices in the language classroom. Given the rise in popularity in emoji use in the last decade, it is not surprising that participants used

emojis similarly, regardless of their attitudes, to encourage collaboration and express their emotions. What was probably most surprising was that participants, as discussed in the *Teaching Presence* section above, took on the role of teacher frequently to assist other students in the class, regardless of their attitudes, which explains why these items were not correlated. See Table 6.

**Table 6** – The Relationship Between Attitudes and Emoji Use

	Ready to Use			Willingness to Apply		
	<i>N</i>	$r_s$	<i>p</i>	<i>N</i>	$r_s$	<i>p</i>
Presence	61	.32	.01*	61	.31	.02*
Cognitive Presence	61	-.09	.48	61	-.01	.94
Teaching Presence	61	.20	.12	61	.24	.06
Social Presence						

*Note.* Significant at the .05 level.

Additionally, emoji use in terms of cognitive presence was significantly, positively correlated to participants' attitudes regarding their willingness to apply mobile technologies (i.e., smartphones, tablets, and apps) to enable and empower learners with diverse backgrounds, characteristics, and abilities ( $r_s = .31, p = .02$ ). In other words, the more willing they were to apply mobile technologies, the more often they used emojis to exchange ideas and apply new ideas throughout the course. Emoji use in terms of social presence was positively correlated to participants' attitudes regarding their willingness to apply mobile technologies, but failed to reach significance ( $r_s = .24, p = .06$ ). Finally, emoji use in terms of teaching presence is not correlated to participants' willingness to apply mobile technologies, ( $r_s = -.01, p = .94$ ). According to Whiteside (2015), when instructors were able to create social presence in their courses, as was the case in the present study, students take on a more active role in constructing their own knowledge, as well as their peers, regardless of experience. Therefore, in the present study, regardless of participants' willingness to apply mobile technologies to empower others, they felt connected and helped shape each others' learning. See Table 6.

### *Relating Participants' Demographics to the Use of Emojis*

To determine how age relates to emoji use, four Spearman Rho analyses were conducted. The ages of the participants ranged from 21 years of age to 60 years of age, with a mean age of 38 years. The results of the analyses revealed no significant correlations for age as it relates to cognitive presence ( $r_s = -.07, p = .62$ ), teaching presence ( $r_s = .10, p = .44$ ), social presence ( $r_s = .04, p = .74$ ), or total presence ( $r_s = -.002, p = .99$ ; see Table 7). In a study by Fullwood, Orchard, and Floyd (2013) on emoji use in internet chat rooms, no significant differences existed across age groups in terms of emoji use. Similarly, Alshenqeeti (2016) suggested that age was not as strong of a predictor of emoji use compared to technological awareness and capability. Therefore, the findings of the current study align with other studies on age and emoji use.

**Table 7** – The Relationship Between Age and Emoji Use

Presence	Age		
	<i>N</i>	$r_s$	<i>p</i>
Cognitive Presence	61	-.07	.62
Teaching Presence	61	.10	.44
Social Presence	61	.04	.74
Total Presence	61	-.002	.99

Finally, to determine how gender affects the use of emojis, four independent samples *t* tests were conducted with gender as the IV and emoji use for each type of presence as the DV. Of the 61 survey participants, 39 were females and 21 were males, and one participant did not specify. In terms of cognitive presence, female participants ( $M = 10.13, SD = 14.30$ ) used emojis to represent cognitive presence slightly more than male participants ( $M = 8.00, SD = 8.38$ ), though not significantly,  $t(58) = .63, p = .53$  (see Tables 8 and 9).

**Table 8** – Descriptive Statistics for Gender and Emoji Use

	Male Participants			Female Participants		
	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>
Presence						
Cognitive Presence	21	8.00	8.38	39	10.13	2.29
Teaching Presence	21	.00	.00	39	.13	.34
Social Presence	21	9.67	9.87	39	12.97	19.84
Total Presence	21	5.89	6.02	39	7.75	11.27

**Table 9** – Gender and Emoji Use t-test results

Presence	<i>t</i>	<i>df</i>	<i>p</i>	Mean Difference	95% CI
Cognitive Presence	.63	58	.53	2.13	(-4.68, 8.94)
Teaching Presence	2.36	38	.02*	.13	(-.02, .28)
Social Presence	.72	58	.48	3.31	(-5.94, 12.56)
Total Presence	.70	58	.49	1.85	(-3.44, 7.15)

Note. Significant at the .05 level.

In terms of teaching presence, female participants ( $M = .13$ ,  $SD = .34$ ) used emojis to represent teaching presence significantly more than male participants, who did not use them at all ( $M = .00$ ,  $SD = .00$ ),  $t(38) = 2.36$ ,  $p = .02$ . In terms of social presence, female participants ( $M = 12.97$ ,  $SD = 19.84$ ) used emojis to represent social presence slightly more than male participants ( $M = 9.67$ ,  $SD = 9.87$ ), though not significantly,  $t(58) = .72$ ,  $p = .48$ . Finally, in terms of total presence, female participants ( $M = 7.74$ ,  $SD = 11.27$ ) used emojis slightly more than male participants ( $M = 5.89$ ,  $SD = 6.02$ ), though not significantly,  $t(58) = .70$ ,  $p = .49$ .

As shown in the analysis of the data, female participants' use of emojis had an impact in the frequency of interactions during the course. Moreover, as can be seen in Figure 5, these participants were the ones who added a more affectionate response to these interactions by posting a great number of emojis that represent affection such as the Face Throwing a Kiss emoji 🥰, Smiling Face With Heart-Eyes emoji 😍, Red Heart emoji ❤️, Cherry Blossom emoji 🌸, etc. Figure 5 also shows evidence that the high frequency of the eight most used emojis was boosted by female participants.



Alshenqeeti (2016) draws attention to the fact that emojis are context situated and, as such, cultural variations may influence their use. In this respect, the high frequency of emojis identified in the interactions of Brazilian teachers also seem both culturally situated and gender related.

## 5. Conclusion

As demonstrated in the results, emojis are largely used to support cognitive, teaching, and social presence. Most emojis fell into WhatsApp's categories of face emojis, people, and gestures. The findings suggest that communication in the context of social networks is becoming more visual and multimodal as evidenced by the use of emojis and more recently by the use of stickers as pointed by Paiva (2016) - this is also the case of gifs, widely used in social media. We share Paiva's ideas that language social practices take place in a complex manner due to the relationship among the various agents and the ways of producing meaning and the technologies mediating these practices.

The analysis evinces that face emojis are very much used as social affective manifestations that are oftentimes intertwined in the interactions coded as cognitive and teaching presence. This supports the findings of Garrison et al. (2007), Molinari (2010), Celani and Collins (2005), and Beuchot and Bullen (2005), who view social presence as a foundation for cognitive presence. Thus, it is possible to affirm that emojis, like written discourse and emoticons, are elements in online interactions that may support cognitive presence.

As pointed out in the findings, the course interactions also reveal that the meaning of emojis may be interpreted differently depending on the context in which they are situated. Many times the wink emoji could be interpreted in such a way as to minimize the impact of an intervention, but at other times it could be interpreted as merely an 'ok'. It is worth mentioning that the emojis were many times used as non-verbal communication resources to make up for the absence of gestures, used in face-to-face interactions, to increase members' proximity and keep group cohesion. In that vein, emojis can be understood as agents in the production of meaning (Paiva, 2016); their use in digital social spaces for teaching and learning also seems to have pedagogical

implications, such as community engagement, group cohesion, task management, non-verbal communication, language use, to name a few. As mentioned in the discussions, the use of emojis can be a great ally to engage participants and build a sense of belonging in this type of community, as well as keep the community cohesion. Emojis can also be used to keep course participants on task and provide just-in-time feedback on the pedagogical activities. Another pedagogical implication is that emojis can be used to make up for lack of visual cues, usually present in face-to-face communication. However, the high frequency of single line emojis, i.e., using only emojis to interact or respond to tasks, may be problematic in the context of education, especially language learning, as written interactions do play an important role in exchanging information, negotiating meaning and developing language.

The number and the types of emojis used in online interactions in educational experiences like this one via WhatsApp may be gender-related and culturally situated. These findings can be taken into consideration when promoting educational initiatives via WhatsApp or any other social space related to social media in multicultural environments. Current trends continue to move towards the need to create more opportunities for social presence in our learning communities and classrooms. Harn (2017) reported on the visual language of emojis and recommended that higher education should consider using emojis in informal communication to reduce social barriers, create connections, and improve overall connections with students by establishing a more personal connection in the communication through the emojis. This research supports that social presence was enhanced during the learning process. Using emojis in the communication lightened the tone of the communication by creating a friendly open trusting rapport, which increased social presence.

Using this type of communication can improve learning experiences in many training and learning settings. The need to evaluate and develop collaborative educational communication, which corresponds with present-day realities, should be explored taking into account pedagogical implication to improve the overall learning environment. As different types of language emerge in these spaces, educators and students should be aware of how different cultures make meaning while interacting. What seems to be a natural way of interacting in a country

like Brazil may be considered inadequate in another culture. The same goes for the meaning of the emojis. Raising awareness of these possible differences may be a new element to add to the netiquette of similar future educational initiatives.

### *Conflict of interests (multiple authors)*

*The authors declare they have no conflict of interest.*

### *Credit Author Statement*

We, Jennifer L. Reeves, Glenda A. Gunter, Junia Braga and Marcos Racilan, hereby declare that we do not have any potential conflict of interest in this study. We have all participated in study conceptualization, methodology, study design, data collection, formal data analysis, statistical data analysis, data validation and editing. All authors approve the final version of the manuscript and are responsible for all aspects, including the guarantee of its veracity and integrity.

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Using the Community of Inquiry framework to analyze emojis ...

## Appendix A – Types of Emojis Used to Support Cognitive, Teaching, and Social Presence

Emoji	Cognitive ( <i>n</i> )	Teaching ( <i>n</i> )	Social ( <i>n</i> )	Total ( <i>n</i> )
	4	1	6	11
	14	2	20	36
	47	18	74	139
	2	1	4	6
	4	1	11	16
	40	12	59	111
	9	8	18	34
	107	29	153	161
	21	6	31	56
	0	0	4	4
	47	5	60	112
	31	0	40	71
	0	0	2	2
	0	0	3	3
	0	0	2	2
	2	1	5	8

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	0	2	5	7
	1	4	4	9
	37	56	158	251
	13	10	35	58
	24	12	41	77
	33	20	68	121
	9	7	17	33
	10	5	21	36
	51	5	64	120
	20	4	23	47
	17	12	8	37
	4	2	5	11
	10	1	9	20
	9	5	17	31
	2	0	3	5
	0	1	2	3
	1	1	2	4
	15	13	31	59
	6	2	4	12
	2	0	3	5

Using the Community of Inquiry framework to analyze emojis ...

	0	2	0	2
	9	3	12	24
	3	0	3	6
	7	14	20	41
	3	0	2	5
	2	0	1	3
	2	0	0	2
	2	0	3	5
	0	6	6	12
	1	0	7	8
	3	5	9	17
	4	0	9	13
	3	3	10	16
	4	5	2	11
	3	0	3	6
	6	0	9	15
	2	0	2	4
	0	0	2	2
	0	6	4	10
	1	0	4	5

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	1	0	4	5
	3	4	7	14
	5	1	7	13
	8	0	10	18
	0	2	1	3
	8	0	1	9
	2	0	1	3
	2	0	2	4
	1	1	2	4
	3	0	0	3
	16	0	0	16

*Note.* Only emojis that were used more than one time were included in the table. The emojis were listed in this table in the order they appear in the interactions.