#Beyond140: Helping Pre-Service Teachers Construct a Community of Inquiry on Twitter

Osman Solmaz, Ph.D.
Department of Foreign Languages (ELT), Dicle University, Diyarbakır, Turkey
osolmaz@dicle.edu.tr

ABSTRACT
The development of socio-interactive web technologies such as social media necessitates the exploration of how they can be effectively appropriated and implemented in educational contexts. In an effort to respond the need, the present study examines the use of a synchronous multimodal tool in higher education context. By applying the Community of Inquiry (CoI) framework by Garrison, Anderson and Archer (2000) on Twitter, the study investigates the social and teaching presence elements of the CoI and pre-service language teachers' perspectives pertaining to the integration of a microblogging tool into a college-level course. For this purpose, the participants and the instructor's tweets posted during the course were collected, and students' opinions regarding the implementation of Twitter were gathered through a survey. Quantitative and qualitative analyses of the data revealed that the participation of pre-service language teachers and the instructor highly indicated social and teaching presences, respectively. It was also documented that students who took the designed hybrid course often reported positive experience in regards to the implementation of Twitter, including a perceived increase in social network literacies. Informed by the scholarship, the results of the study illustrated that social networking sites could provide spaces to establish and maintain a participatory community of inquiry in post-secondary settings.

Keywords: Community of Inquiry, Social Networking Sites, Social Presence, Teaching Presence, Higher Education

INTRODUCTION

The use of social media and the development of online, hybrid, and collaborative models of educational delivery are among the key trends accelerating educational technology adoption in higher education space (The NMC Horizon Report, 2016). It is generally acknowledged that the shifting paradigms in education and the growing popularity of Social Networking Sites (SNSs) play a part in the pedagogical employment of online technologies. Such gravitation towards providing more learning and teaching experiences online in higher education requires teachers and learners to be prepared for their new roles (Redmond, 2011). Despite technology being embedded in the lives of higher education students, it is highlighted that academic use of these technologies is not efficiently harnessed and widespread presence of them do not necessarily translate into meaningful and intuitive academic uses (ECAR, 2015). This necessitates the exploration how a wide array of interactive technologies can be effectively appropriated in post-secondary settings. Being one of those widely used media, SNSs may provide opportunities for educators to make learning more interactive and collaborative.

Informed by the Community of Inquiry (CoI), a framework designed to guide the research and practice in online learning by Garrison, Anderson, and Archer (2000), the present paper examines the use of Twitter in an undergraduate course at a public university in Turkey, in which English language teacher candidates engaged collaboratively in face-to-face and online environments. The introductory section of the paper provides an explanation of the nature of Twitter as a social networking tool and proceeds with the theoretical framework of the study. In order to contextualize the current research appropriately, the relevant scholarship on the use of Twitter in education and social and teaching presence-emphasized CoI research is presented. This is followed by a description of the methods employed, and the findings section in which, analyses of the collected data are made. The paper concludes with the discussion of key findings, limitations, and implications of the study.

Twitter as a Social Networking and Microblogging Tool

Twitter is a popular online social networking site and microblogging service that allows its users to post and read entries known as "tweets". Individuals participate in the site by sharing tweets that are composed of 140 characters or less, responding to tweets, exchanging direct messages (DM), following and being followed by other users. Tweets often contain "hashtags", the use of hash (#) symbol with a word or phrase, which allows

users to identify or categorize their tweets and enable other members to find tweets that share a common theme. User profiles are indicated by a username designated with the "@" symbol and they include profile photo and background photos of choice, composed tweets and redirected tweets from other users which are known as "retweets" (RT). When individuals sign up for Twitter, their accounts are public by default; however, they can "protect" their tweets by requiring manual approval of each and every person who wants to follow them. Incorporated in 2007, Twitter has more than 310 million monthly active users as of August 2016 (Twitter, 2016). The consensus view among social media scholars seems to be that a number of the features of Twitter (e.g., mobility, the frequency of update) are more prominent compared to other SNSs. Mobility is "perhaps the most powerful aspect of microblog platforms" (Ebner, Lienhardt, Rohs, & Meyer, 2010, p. 93), as users can participate by means of web interfaces, free applications for mobile phones and tablets, and texting services without any time and place restriction. The fact that 80% of active users are on mobile (Twitter, 2016) shows that people exploit the potential of the mobility feature. Another distinct feature of the platform is the possibility of sending several tweets in a single day with a less amount of time invest thanks to the 140-character limitation. However, all the users do not utilize the medium in the same way, resulting in the emergence of various styles and cultures-of-use (Thorne, 2003). In one of the earlier studies, Java, Song, Finin and Tseng (2007) identified four main user intentions on Twitter which were daily chatter, conversations, sharing information or URLs, and reporting news. In a recent study, Kimmons and Veletsianos (2016) found that both professors and students had similarities and differences in the ways they used Twitter and its particular functions such as hashtags. They suggested further research exploring how SNSs are integrated into the lives of scholars.

The conversations on Twitter are facilitated through the use of @ sign as an indicative of a tweet that is addressed to a particular user (i.e., @username), a form of "addressivity" (Honeycutt & Herring, 2009), and a marker of "social coherence and community forming" (Borau, Ullrich, Feng, & Shen, 2009, p. 84). Prior research (e.g., Ricoy & Feliz, 2016; Veletsianos, 2012) documented interactional exchanges taking place for collaborative purposes on Twitter. Honeycutt and Herring (2009), for example, revealed that a significant majority of @ signs on Twitter functioned as "addressivity" and users were already taking advantage of the microblogging for informal collaborative purposes. They claimed that tools like Twitter would soon come to be used in formal collaborative contexts, and the growing literature on the educational uses of Twitter in formal environments (e.g., Gao, Luo, & Zhang, 2012; Junco, Elavsky, & Heiberger, 2013) confirmed their predictions. Considering the ubiquity and accessibility of web 2.0 technologies, it is not surprising that educators started to explore the interactive nature of social networking tools. This study contributes to the current discourse of the scholarship by further exploring the implementation of microblogging in higher education and potential contributions of SNSs in the maintenance and formation of community of inquiries by both in-service and pre-service teachers.

THEORETICAL FRAMEWORK

This study is informed by the theoretical framework of the "Community of Inquiry" (CoI) which was developed by Garrison et al. (2000). Philosophically rooted in collaborative constructivism (Garrison & Archer, 2000), the CoI is one of the most influential models that has been used to study critical reflection and discourse in online learning in higher education (Garrison & Akyol, 2013). The core of the framework is the construction of deep and meaningful knowledge (i.e., educational experience) in online learning environments through the formation of a community of inquiry. As shown in Fig. 1, the framework is consisted of three dynamic interdependent elements: social presence, cognitive presence, and teaching presence. (Garrison et al., 2000). Social presence, the first element and of central importance in this paper, is the social and emotional projection ability of participants in a community of inquiry as 'real' people by the use of the online medium. Teaching presence, the second element and of equal prominence here, is the design and facilitation of the educational experience for meaningful and worthwhile learning outcomes. Finally, cognitive presence is the construction and meaning confirming ability of learners by engaging in a sustained reflection and discourse in an online community of inquiry (Garrison et al., 2000).

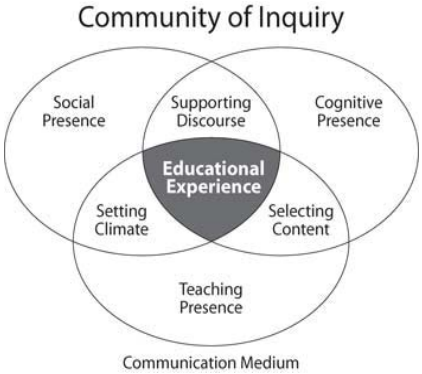

Fig. 1. The Community of Inquiry Framework (from Garrison, Anderson, Archer, 2000)

The quantitative assessment of the three elements of the CoI is conducted through content analysis of transcripts in an online community of inquiry by using the indicators which are prepared for this purpose. Three categories of indicators for social presence are affective responses (expression of emotions, use of humor, self-disclosure), interactive responses (continuing a thread in a discussion forum, quoting others, referring other's messages explicitly, asking questions, complimenting appreciation, expressing agreement), and cohesive responses (vocatives, addresses or refers to the group using inclusive pronouns, phatics and salutations) (Rourke, Anderson, Garrison, & Archer, 2001). There are three categories of indicators for teaching presence as well: instructional design and organization, facilitating discourse, and direct instruction. While the category of instructional design and organization encompasses indicators such as setting curriculum, designing methods, establishing time parameters, utilizing medium effectively, and establishing netiquette, indicators for the category of facilitating discourse reflect teacher postings ("tweets" in this research) which stimulate social process as well as individual and group learning. The final category of direct instruction has indicators showing intellectual and scholarly leadership of teachers and their subject matter knowledge (Anderson, Rourke, Garrison, & Archer, 2001). According to the model, the result of a combination of social presence with appropriate teaching presence "can be a high level of cognitive presence leading to fruitful critical inquiry" (Garrison, et al., 2000, p. 96). Guided by this information, the current study aims to test social and teaching presences in a community of inquiry by expanding the testing of the model into synchronous multimodal environment.

RELEVANT LITERATURE

Microblogging in Higher Education

There is a growing body of research concentrated on microblogging in higher education (e.g., Gao et al., 2012) and most of them focus on Twitter with the exceptions of the studies conducted by Ebner (2009) and Ebner et al. (2010), who used an institutionally developed platform, and Holotescu and Grosseck (2009) who analyzed a Romanian microblogging tool. The analysis of the literature on microblogging in higher education reveals the affordances of microblogging, the potential of Twitter to function as a platform for educational networking, and limitations of microblogging tools.

Research delineated that students often had positive inclinations and attitudes towards the implementation of microblogging tools in formal settings. They had favorable feelings (Hung & Yuen, 2010; Lim & Richardson, 2016; Ricoy & Feliz, 2016), enjoyed the experience of being involved (Carpenter, 2015), and found it less intimidating to contribute to lectures (Tiernan, 2013). However, not all learners were accounted for equal contribution and some of them did not actively participate (e.g., Elavsky, Mislan, & Elavsky, 2011; Gao et al., 2012). Nevertheless, the potential of microblogging to promote community building and facilitate engagement was consistently acknowledged in previous research. It was highlighted that microblogging helped students develop a strong community through a sense of belonging (Borau et al. 2009; Ebner et al., 2010;), feel included by finding social support and reducing isolation (Hung & Yuen, 2010; Tiernan 2013; Wright 2010). Researchers also asserted that microblogging facilitated communication, engagement, collaboration, and enhanced social presence of students (Dunlap & Lowenthal, 2009; Elavsky et al., 2011; Junco, Heiberger, & Loken, 2011). Elavsky et al. (2011), for instance, demonstrated that the extent of rich student engagement on Twitter generally improved participation and enthusiasm of students pertaining the course. Both Grosseck and Holotescu (2008) and Honeycutt and Herring (2009) directly addressed the facilitative role of @ sign in engagements on Twitter. The latter revealed that the engagements were not simply short, dyadic exchanges, but they were also coherent longer conversations including multiple participants.

Previous work also acknowledged that microblogging fulfilled the need for an even faster mode of communication. The immediate nature of Twitter was positively remarked in the literature (Ebner et al., 2010), as student issues were addressed, feedback were provided, and ideas between instructors and learners were exchanged in a timely manner (Gao et al., 2012; Junco et al., 2011). The immediacy of Twitter is partly due to the 140-character limitation, yet educators noted that learners could not express complex thoughts in 140 characters (Ebner et al., 2010), were unable to go into a lot of detail in their comments (Ricoy & Feliz, 2016), and they initially found it difficult to explain ideas (Wright, 2010). However, it was also illustrated that the character limitation garnered the attention by requiring a great deal of summarizing (Ebner, 2009; Holotescu & Grosseck, 2009), forced writing concisely (Dunlap & Lowenthal, 2009; Ricoy & Feliz, 2016), did not seem to hinder student engagement and "encouraged students to process the information and present it back to the group in a thoughtful and more meaningful way" (Tiernan, 2013, p. 15).

Despite the `noisy` environment on Twitter, and the constant flow of information which sometimes made it difficult for students to reply one another and led to information overload (Ebner et al. 2010), microblogging was found to support informal learning and promote active learning beyond classrooms (e.g., Gao et al., 2012; Junco et al., 2013) by creating an online extension of the classroom. Aside from the support for learning outside classroom, microblogging was used as a back-channel to make announcements, coordinate activities, share ideas and resources (Elavsky et al., 2011; Yakin & Tinmaz, 2013). Ebner et al. (2010) and Wright (2010) pointed out the advantage of well-documented processes in microblogging contexts. Chronologically logged entries made students' working processes, current information on the status of their learning and individual contributions to become more transparent. Finally, examining the engagement and academic achievement of college students in their empirical study, Junco et al. (2011) determined that students with whom Twitter was used were significantly more engaged in the classroom and had higher semester grade point averages compared to the control group.

Social and Teaching Presences

As laid out above, social networking tools are reported to have the potential to facilitate communication and collaboration in both well-structured settings and beyond the classrooms. Since the present research aims to investigate the role of a synchronous social networking tool in the formation of social and teaching presences of an online community of inquiry, the past research on the notions of social and teaching presences will be discussed further.

Social presence as an element of the CoI framework has been employed in previous works and identified as an important factor in the establishment of a critical community of inquiry (e.g., Lomicka & Lord, 2012, Redmond, 2011). Studies uncovered that social presence could assist learners with the development of a community of inquiry (Dunlap & Lowenthal, 2009; Lomicka & Lord, 20012; Rourke et al., 2001) and it has the potential to compensate for the absence of teaching presence (Morueta, López, Gómez, & Harris, 2016). Swan and Shih (2005) revealed that students perceiving the highest social presence projected themselves into online discussions more compared to students with low social presence. In another research, Redmond (2011) noted that social presence was required to break down the barriers among participants which would eventually lead to an increase in their willingness to share experiences and contribute to the conversation.

Even though a relatively high number of studies were conducted on social presence, little research (Dunlap & Lowenthal, 2009; Lomicka & Lord, 2012) has investigated the relationship between social presence and the formation of a community of learners explicitly in Twitter context. In one of those studies, Dunlap and Lowenthal (2009) showed that Twitter enhanced social presence in online courses and observed that "synchronous just-in-time nature of Twitter provided us [them] and our [their] students with opportunities to connect and be perceived as 'real'" (p. 133). In language learning and teaching context, Lomicka and Lord (2012) demonstrated that social presence was present in participants' tweets and Twitter was a tool that allowed learners to build social presence and create community.

Given that instructor organizes and monitors the social and cognitive dynamics of the classroom (Redmond, 2011), it is hardly a surprise that teaching presence has attracted similar attention from academia. The role of teaching presence in the formation of a meaningful online community has been shown in the previous works (Akyol & Garrison 2008; Anderson et al., 2001). To illustrate, Redmond (2011) asserted that the personalized tone of the content and discussion by instructors could make students notice the instructor's enthusiasm, which in return can increase learners' motivations. In Kim, Song, and Luo's (2016) inquiry, the findings suggested a relationship between teacher immediacy and social presence, while Song, Kim, and Luo's (2016) research revealed that verbal immediacy practices like self-disclosure contributed to meaningful online learning experiences.. Despite the research reporting Twitter to mobilize instructors into a more active role with students

(Dunlap & Lowenthal, 2009; Junco et al., 2011), a review of the CoI literature did not reveal any research systematically addressing the relationship between teaching presence as a CoI element and the use of Twitter as a social networking tool in an educational context.

The emergence and adoption of social media led scholars of higher education to examine the perceptions of students and teachers concerning the use of these technologies for pedagogical purposes. Examining the perspectives of forty-six students on a variety of online social networks, Hamid, Waycott, Kurnia, and Chang (2015) found that students recognized the value of these socio-interactive technologies for pedagogical purposes. Further evidence corroborating the positive perceptions of students comes from recent studies. The potential of social media use in education was favorably voiced by a large group of 276 students in Neier and Zayer's (2015) study, while Lim and Richardson (2016) lent support to the claim by reporting positive perceptions of eighty-two students. However, the research addressing this issue generally approached social media as a whole rather than focusing on a single category of such technologies (e.g., social bookmarking, social networking) (but see Carpenter, 2015). In a different yet relevant strand of research investigating Twitter use by in-service teachers for professional purposes (Carpenter & Krutka, 2014, 2015; Risser, 2013; Visser, Evering & Barrett, 2014; Wesely, 2013), both qualitative and quantitative findings revealed that teachers considered Twitter as an efficient and accessible venue for their professional development where they were able to interact with colleagues in a participatory environment. One of those studies (Wesely, 2013) demonstrated the successful adoption of collaborative web technologies for an innovative form of professional development specifically by language teachers. Understanding teacher candidates' opinions towards the integration of particular social networking technologies for pedagogical purposes and the use of them for their professional development should merit attention since preferences and practices of students can inform future research and provide practical implications for higher education, particularly in the contexts of technology integration, teacher education, and autonomous professional development.

Research Questions

The insights drawn from the scholarly literature have shown that both social and teaching presences had a role in the construction and maintenance of a critical community of inquiry. Yet, an overwhelming majority of the studies are conducted in settings where discussion boards are employed. This is understandable as the framework itself was initially designed for online learning and teaching in text-based asynchronous environments (Garrison et al., 2000). However, the emergence and the affordances of the socio-interactive sites like SNSs inevitably require the CoI framework to be further explored in synchronous multimodal spaces as well.

Guided by the Community of Inquiry (CoI) framework, the chief aim of this study is to investigate to what extent social and teaching presences occur in a synchronous Twitter-based collaborative environment in higher education. The following research questions were designed to lead the current study:

1. What are the levels of social presence of pre-service language teachers in a synchronous hybrid microblogging context like Twitter?
2. What are the levels of teaching presence of a teacher educator in a synchronous hybrid microblogging context like Twitter?
3. What are pre-service language teachers' opinions regarding the integration of Twitter into college courses?

METHODS

Context, Participants, and Procedure

Twitter was the medium of choice over other SNSs mainly because of the need for the implementation of Twitter from the perspective of community of inquiry in higher education and the author's familiarity with it. In addition, Twitter is one of the most popular microblogging services in Turkey, and around 6.5 million people (17% of the population) were reported to have used the medium in late 2014 (Digital News Report, 2015). Often used for social and political expression in the country, the value of Twitter for educational purposes has been recognized by universities (Yolcu, 2013), however, systematic efforts for widespread training opportunities are crucial for the implementation of social media (Gulbahar, 2014). The current study was also designed in an attempt to respond the need through the lens of scholarship in the field.

Thirty-six third-year pre-service language teachers (25 female, 11 male) were enrolled in a required three-credit "Community Service Practices" (CSP) course at a university in southeastern Turkey. The participants were between 20 and 25 years old, and a majority of them accessed internet via their personal computers/laptops or mobile phones. 24 of the students reported their weekly computer use as 9 hours or less, while the rest of the participants used computer as much as 20 hours per week. The self-reported computer literacy level (i.e., being

able to carry out tasks on a computer efficiently) of 6 students was low, whereas most of the students (n=22) ranked their literacy level as `average`. As revealed by the results of the pre-research survey, Facebook was the most popular social network site adopted by the participants (n=26). While only few of the English language teacher candidates (n=6) had used Twitter for personal purposes prior to the class, none of them had previous experience with educational use of microblogging prior to the class.

The CSP course was designed as a constructivist course where learners develop solutions to problems by engaging in sustained discourse and inquiry. Over an academic semester (approximately 14 weeks), 12 meetings (half online, half face-to-face) were held. Even though the class was not entirely online, the design was informed by Salmon's (2003) online teaching presence stages that include; a) access and motivation, b) online socialization, c) information exchange, d) knowledge construction, e) development. The first two weeks of the course was conducted in classroom context where students were acquainted with the goals and basics of the course as well as the information regarding the nature and samples of community service projects. After the introductory face-to-face meetings, Twitter as an online teaching and learning space was introduced in week 3 and 4. The author provided technical guidance and assistance for teacher candidates. While students were familiarizing themselves with Twitter, basic activities were created and initial discussions on various aspects of community services were carried out with them. The lessons in week 3 and 4 were held in computer lab of the institution in two separate sessions (18 participants per session). Following the first four weeks, groups of four to six students were formed and the remaining eight weeks of the course were conducted in both face-to-face contexts (weeks of 5, 6, 9, 10) and online (weeks of 7, 8, 11, 12) in an alternating order. Students synchronously participated in online discussions by collaboratively exchanging information and constructing knowledge for the purpose of developing various community service projects through tweets. These live online sessions were held with an average of 6 participants in each session. In face-to-face meetings, students finalized their projects and accomplished them. In the final online sessions, students met on Twitter again to share experiences about the process and reflect on their work. In brief, it was aimed that students would engage in the course both by participating in discussions in physical classroom setting and through forming an online community of practice through composing tweets in a social network context.

In addition to the self-developed collaborative group projects, each student was required to visit the local school for the visually impaired and write a report about their experiences as part of the classroom requirements. Furthermore, initiated and led by one of the groups, all of the students developed a community project to assist children at a school in a remote village. The class was finalized with the presentations of students' projects in the classroom and the evaluation of the projects.

Data Collection and Analysis

As the instructor of the class, the author interacted with students both in face-to-face and online platforms, and collected the data. Out of thirty-six students, only the tweets of those who attended all the online sessions were gathered. The tweets of students who missed one or more sessions, and those who deleted some of their tweets early in the semester were not taken into consideration. As a result, a total of 1693 tweets were obtained from 17 participants (Fig. 2). The average number of tweets posted by these students was 99.5. Since the data was large, 6 focal participants (4 female, 2 male) were selected to represent the sample. Two of these students had the highest number of tweets, two of them had the lowest, and the remaining two had the number of tweets which were closest to the median.

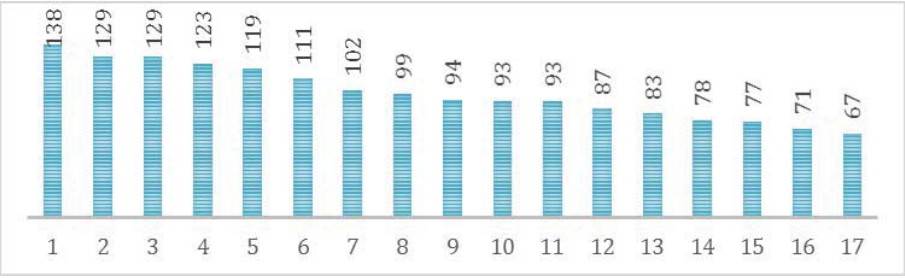

Fig. 2. Total number of tweets posted by participants (n=17) during six sessions.

The average number of the tweets composed by focal students was 100.8. Since the participation of the students in this study might not be directly associated with the number of tweets they sent, the addressivity percentage of students were taken into account as well. As shown in Fig. 3, a substantial number of the participants' tweets included "@" sign indicating "addressivity", indicating communication with others via the medium. The analysis

yielded that 79.9% of all tweets included at least one addressivity. Since the average percentage of addressivity in focal participants' tweets was 81.2%, it was decided that the selected six students could represent the sample group.

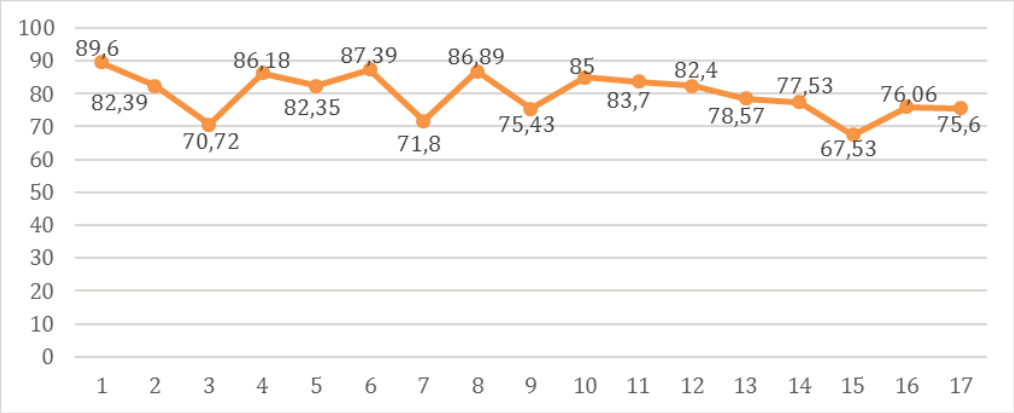

Fig. 3. The percentages of tweets with addressivity per participant (n=17) as indicated by @ sign.

Content analysis of the tweets was undertaken after the collection of all tweets of focal students (n=605) and the instructor (n=743) excluding RTs. All the tweets were coded by the author and a Turkish and English-speaking researcher who was familiar with the framework. Following the establishment of inter-rater reliability prior to coding all the tweets, the data were separately coded and verified. In case of a disagreement, the discussions were held between the raters until both of them agreed on the codes and their categories.

Social presence indicators in participants' tweets were analyzed by following Rourke et al.'s (2001) indicators. However, Lomicka and Lord's (2012) Twitter-adapted indicators were also taken into account since it was modified by the authors for indicators to reflect on the activities that specifically can and cannot be done through Twitter (Table 1). For instance, `quoting` as one of the interactive indicators correspond to the activity of retweeting on Twitter (i.e., quoting someone's message in a tweet). In many cases, more than one category was assigned to the same tweet due to the multiple presence of indicators. For example, the tweet in which one participant interacts with a colleague by typing *"@student7 reading? I love it! :)"* was categorized as *Emotion* for involving the use of emoticons, and *Self-disclosure* for revealing participant's interest in reading. In cases when there was no indicator for social presence, no codes were assigned.

Table 1: Content analysis categories, indicators, and samples for social presence

Category	Indicator	Example from the present study (translated from Turkish)*
Affective	Humor (jokes, etc.)	@teacher after going to the animal shelter, I now better empathize with animal lovers, especially with [student's name] :)
	Emotion (all caps, emoticons)	@student13 @student22 ok sweetie we all love you, you know that right??
	Self-disclosure	@student7 reading? I love it! :)
Interactive	Continuing/Reply	@teacher you're quite welcome! It was a pleasure. See you.
	Quote/retweet	After the game, the king and the pawn go into the same box. Italian Proverb
	Content reference	@student1 @student32 @student23 @student25 @student10 @student14 not sure why, but I am not scared of this at all!
	Compliment, appreciation	Happy to have the class of #csp. It is very enjoyable.
	Ask question	@student17 @student6 @student12 what's the connection between two sentences???
	Agreement	@student24 @teacher yes, I completely agree.
Cohesive	Vocatives/names	@student22 welcome my dear [student's name] :))))
	Inclusive pronouns	@teacher we were waiting for you :)
	Phatics, salutations	See you, take care of yourself.
	Address group	Have a nice day, everyone! :D

*Twitter IDs and the course hashtag are replaced with pseudo-IDs for the purposes of anonymity.

Later, Anderson et al.'s (2001) list of indicators for teaching presence was employed for the analysis of the instructor's tweets (Table 2). No change was needed for the indicators of teaching presence categories although attention was paid to the identification of indicators in Twitter context. For instance, *Drawing in participants, prompting discussion* in the category of *Facilitating Discourse* was interpreted as involving students in a discussion by using their Twitter handles which functioned as their names, while *Utilizing medium effectively* included specific tips and suggestions for efficient use of Twitter. However, the original categories from Anderson et al.'s (2001) list did not require a considerable change for social network context. For example, indicators like *Summarize the discussion* or *Setting climate for learning* were categorized in the same way they would be in a study in which a bulletin board was the medium. The only difference was the length of the content since each tweet was composed of 140 characters or less in the context of the present study. Finally, similar to the coding of social presence indicators, tweets were sometimes coded for more than one category when they reflected more than one indicator.

Table 2: Content analysis categories, indicators, and samples for teaching presence

Category	**Indicator**	**Example from the present study (translated from Turkish)***
Instructional Design and Organization	Setting curriculum	Today we are going to talk about educational technologies #csp314 can you watch this video? [link to the video]
	Designing methods	#session2 now we're having a pair talk. I will share a quote and you'll discuss it in pairs.
	Establishing time parameters	Thank you for your participation today. See you next week! #csp314 #session1
	Utilizing medium effectively	This is new account. Pls follow back! #csp314
	Establishing netiquette	Say 'hi' when you are online!
Facilitating Discourse	Identifying areas of agreement/disagreement	@student15 bravo! I couldn't agree more!
	Seeking to reach consensus/understanding	@student32 @student28 @student04 @student23 @student14 I agree with "@student32", the important thing is to reach out students. I think it will be great.
	Encouraging, acknowledging, and reinforcing student contributions	Thank you for your interest, friends. We will continue to discuss same time next week. Great ideas came out!
	Setting climate for learning	Friends, you can join any conversation. You can also ask questions to your friends, feel free!
	Drawing in participants, prompting discussion	@student21 @student13 @student27 @student05 yes, let's start brainstorming. What do you have in your mind?
	Assess the efficacy of the process	Let's not distract others! :)
Direct Instruction	Present content/questions	@student22 so, our prejudices prevent us from serving the community, right?
	Focus the discussion on specific issues	@student12 good point, how about reaching out the people living in the villages?
	Summarize the discussion	Yes, we all agree that moral education matters. Especially the notions of honesty and sincerity.
	Confirm understanding through assessment and explanatory feedback	@student3 that's an important point, here comes the teacher. Then, we can say internal motivation is not always enough?
	Diagnose misconceptions	@student15 @student28 @student11 it may be hard to do that if you are not expert in drug addiction. You aren't expert, are you? :)
	Inject knowledge from diverse sources	@student32 don't try to make them love you. Remember my first class with you :)
	Responding to technical concerns	@student26 welcome [student's name], you can also follow [the discussion] from my timeline.

*Twitter IDs and the course hashtag are replaced with pseudo-IDs for the purposes of anonymity.

In addition to the analysis of the tweets, all thirty-six students' opinions on the incorporation of Twitter into the course were taken through a survey at the end of the semester. The survey mainly included open-ended questions since the purpose was to receive and document the voices and experiences of students in reference to the course

and the implementation of Twitter. In order to group similar arguments and identify patterns resulting from the participants' responses, the collected data was carefully organized and thematically categorized by means of a coding strategy. The goal of coding was "to fracture the data and rearrange them into categories that facilitate comparison between things in the same category" (Maxwell, 2013, p. 107) and there were no preset categories. Thus, the coding categories mainly emerged from the inductive coding process, which is a data-driven way to segment and label text in qualitative analysis (Schreier, 2012). As part of the process, major themes (e.g., media literacy of the participants) were formed through the combination of smaller categories. Following the categorization of the data by overarching themes, the arguments identified in each category were carefully analyzed with regard to the overall experience.

RESULTS

Social Presence

The indicators were coded in three main categories: affective, interactive, and cohesive. The content analysis of the data revealed that all three categories of social presence were present in various degrees in focal participants' tweets (Table 3). Of all the coded tweets, 53.8% (n=551) of them included at least one interactive indicator, 29.61% (n=303) had affective indicators, and 16.53% (n=169) of the analyzed tweets were coded with cohesive indicators.

Table 3: The distribution of Social Presence indicators by focal participants (FPs)

	FP #1	FP #2	FP #3	FP #4	FP #5	FP #6	TOTAL
Affective	53	112	9	44	53	32	303
Interactive	139	98	113	91	64	46	551
Cohesive	37	32	32	20	34	14	169
Total	229	242	154	155	151	92	1023

Given that the average number of tweets posted by focal participants was 100.8, the results in Table 3 indicate that social presence was clearly present in this particular community of inquiry. Considering that low frequencies may index a cold and impersonal social environment (Rourke et al., 2001), it can be argued that the data reflects that participants felt a sense of solidarity with the group in a relatively close group.

More interactive indicators (53.86%) were found than affective (29.61%) and cohesive (16.53%) ones. This outcome is not surprising, as the course design required students collaborate with each other and develop a project together. Participants often interacted with each other by asking questions, referring to the tweets of others, expressing agreement and facilitating discourse. Likewise, affective indicators were found to be high. It may be explained with the fact that not only the environment might have promoted it, but also these students knew each other before taking the CSP class and collaborated in the groups of their preferences online. The lowest category was cohesive indicators. As mentioned by Lomicka and Lord (2012), it might be due to the nature of the tool since individuals can address somebody by their usernames and not necessarily on a first name basis. Nonetheless, there were many cohesive indicators and most of them were salutations of the students who greeted their friends when they got online and employed closures when they signed off Twitter. Overall, it might be argued that social presence was present in various degrees and forms within Twitter context in this specific community.

Teaching Presence

The analysis of the data yielded that indicators in the category of "facilitating discourse" (n=655) were evidently present in the data. The category of "facilitating discourse" was followed by "direct instruction" (n=301) and then "instructional design and organization" (n=199).

Given the design and purpose of the course, it was perhaps not a major surprise to see the presence of facilitating discourse indicators at 56.70% of the coded tweets. It was evident in the teacher-student interactions that the maintenance of students' interests, motivation and engagement was targeted through the sustained discourse. As pointed out by Anderson et al. (2001), the demanding role of teacher, which carries higher levels of responsibility for maintaining discourse, creates and sustains social presence. Coded tweets illustrate that the instructor displayed his presence during the interactions by facilitating discourse through prompting questions, encouragements, identifying areas of agreements and disagreements, and assessing the efficacy of the process from time to time.

The 26.10% of the tweets were coded under the category of "direct instruction", which had the second highest number of indicators. The analysis uncovered that the coded tweets in this category generally demonstrated the instructor focusing the discussion on specific areas, presenting content and asking questions, injecting

knowledge from personal experiences. Summarizing the discussions and responding to technical concerns were generally low. While the first one is associated with the limited character interface of the medium, the latter is mostly because students developed their Twitter literacies and did not need to ask questions after the first two sessions. Meanwhile, it was expected that the category of instructional design and organization, which consisted of 17.20% of the tweets, would be lower. However, the limited experience of students with online learning process and Twitter as well as the shifting directions of the active discussions perhaps had a role on the teacher becoming more present in terms of this particular category. The medium was also used as a back-channel to communicate with students about their schedule of visits to the school of the visually-impaired and the expectations of the instructor about their reports. In sum, all three categories of teaching presence existed in various ways in the data generated from the tweets of the instructor.

The Reflections of the Participants

In order to have a comprehensive picture of the educational process and the effort of the creating an online community of inquiry, importance was attached to the insights gained from learner reflections. To serve this purpose, all thirty-six participants' opinions on the incorporation of Twitter in the course were requested. Based on their experiences, learners mentioned both benefits and drawbacks of the process, which are discussed below and illustrated by students' views. Overall, students were generally positive about the experience.

A particular issue addressed by the students was how Twitter mediated a forum for a high number of interactions to take place. One student commented, *"There were a lot of interactions. We had the opportunity to share our responses and opinions about a topic".* However, the fast-paced nature of Twitter and the interactions that occurred were sometimes challenging for a few of students. For example, one of the students noted that following the tweets that were simultaneously composed was difficult in several occasions. In a similar vein, another student had experienced a hard time due to the `noisy` environment: *"When I was writing to my friends, I used to see that some of them were discussing another topic. I couldn't share my opinions in some of the topics because of this".* Nonetheless, most of the students recognized the importance of such active involvement in a flexible and relaxed setting. Making a comparison between face-to-face and online aspects of the course, one of the students stated, *"Compared to a physical classroom, sharing ideas were in a very relaxed environment".* A similar line of thought was elaborated by another student: *"I could better express the things that I couldn't talk and share in the classroom thanks to Twitter".* Finally, several students praised the accessibility of the medium as it allowed them to participate in discussions without any physical space constraints.

The responses of students also revealed that technology and media literacy of the learners played a role in their participation in the online phase of the course. One student mentioned that his slow typing prevented him being more active in the discussions, while another student pointed out that the differences between media literacy of students sometimes caused a pause and delay in the exchange of ideas. Despite this drawback, several students believed that the overall experience improved their technological competencies such as the use of computer and the internet/SNSs. Another benefit that was voiced by students was the documentation of the process: *"Being able to read what's been written later made the discussions lasting".* This seemed to be particularly helpful to those who missed a part of the discussions or wanted to go through the conversations taking place in other groups. As a disadvantage, students expressed their concerns about the technical problems that occurred during the sessions, such as disconnection and low quality of internet connection. Finally, a few of students were challenged by the limited number of characters allowed on Twitter, while others positively embraced the constrained space of the medium. One of the students commented, *"I could express myself briefly and concisely".* It is to be noted that students generally experienced more character limitation than a typical user since they included the usernames of their group members in their tweets.

In brief, from the above quotations and observations, it is seen that students often had favorable feelings towards the integration of Twitter into classroom by stressing the difference of the experience from a traditional classroom.

DISCUSSION

The aim of the present study was to explore the affordances of the social networking tools in higher education. Informed by the Community of Inquiry framework, this study specifically investigated the role of a synchronous SNS in the formation of an online community of inquiry and aimed to shed light on the extent social and teaching presences could be present in the adoption of such a medium. The results indicated that a synchronous microblogging tool allowed pre-service language teachers to establish social presence, and for the instructor to establish teaching presence to a great extent in a Twitter-based community as part of a higher education course. It was also highlighted that pre-service language teacher participants generally had positive inclinations towards the integration of Twitter into their courses.

The convergence of the literature on microblogging in higher education and the CoI revealed limited research about the use of Twitter for the analysis of social presence and teaching presence elements of the CoI framework in post-secondary context. Much research focus on discussion boards which are asynchronous text-based environments, making it difficult to directly compare the outcomes of the current study and past research. However, parallels can be drawn. It was consistently shown in the literature that that social presence and teaching presence positively affected the construction and sustenance of a community of inquiry (e.g., Akyol & Garrison, 2008; Dunlap & Lowenthal, 2009; Swan & Shih, 2005; Redmond, 2011). Displaying the establishment and continuance of social and teaching presences on Twitter, this study contributes to the existing literature by showing that synchronous social networking tools have the potential to provide a space for the construction and maintenance of a community of inquiry. This is consistent with the study of Dunlap and Lowenthal (2009), which found that Twitter enhanced students' social presence in an online instructional design and technology class, and that of Lomicka and Lord (2012), which showed that Twitter was capable of allowing participants to build social presence and create a community.

The previous work highlighted social presence (Akyol & Garrison, 2008; Dunlap & Lowenthal, 2009; Swan & Shih, 2005) and teaching presence factors (Akyol & Garrison, 2008; Bangert, 2008; Redmond, 2011) among the predictors of student satisfaction with their academic programs. Redmond's (2011) study, for instance, revealed that high levels of teaching presence could encourage student participation and cognitive engagement in the course. Bangert's (2008) empirical study uncovered that online-learning environments supporting both social and teaching presence provided "prime conditions for nurturing and sustaining deep levels of critical inquiry" (p. 53). A number of studies also showed the relationship between the three elements of the CoI and social and teaching presence influencing cognitive presence (e.g., Kozan & Richardson, 2014). In consideration of the literature, it can be speculated that higher social and teaching presence in this study facilitated the participation and engagement of learners by assisting them establishing levels of cognitive presence in a Twitter-based community.

Within the scholarship of microblogging in higher education, the findings of the present study correspond to the outcomes of other studies (e.g., Taşkıran, Bozkurt, & Aydın, 2016; Tiernan, 2013), which revealed the potential of microblogging in the promotion of community building and the facilitation of engagement. In addition, this study confirms the findings of Honeycutt and Herring (2009), who documented that the nature of engagements on Twitter displayed both short exchanges and coherent longer conversations, and carries over this general finding into a formal educational context. However, the participants of the current study expressed mixed reflections about the 140-character limitation of the medium and this finding is in line with the past research (e.g., Ricoy & Feliz, 2016; Wright, 2010) in which positive and negative experiences with regard to this particular feature of Twitter were reported. Finally, investigating the interactions of educators in a popular synchronous chat on Twitter, Gao and Li (2016) warned that the character limitation might cause discussions not to go further in-depth. The findings of this study validate the warning and further add that 140-character limitation could particularly prevent collaborative conversations to be held as such collaboration may require more than one user to be addressed in a single tweet, thus leaving less space for the content.

The outcomes of this study in terms of students' participation do not coincide with the studies (Elavsky et al. 2011; Gao et al., 2012; Lomicka & Lord, 2012; Tiernan, 2013), which reported that only some of the participants actively contributed to the discussions. Despite the fact that only the data of seventeen participants out of thirty-six students were shared here, missing one session or starting to tweet later did not seem to prevent all participants to be active members of the online community. However, many of the participants discontinued to use Twitter once the course was over. This finding is consistent with the research of Carpenter (2015). Examining pre-service teachers' intended and actual use of Twitter for professional purposes in a semester following a teacher education course, which encouraged teacher candidates to use Twitter, he discovered that the majority of them did not engage in such activity. These findings notwithstanding, some studies (Dunlap & Lowenthal, 2009; Holotescu & Grosseck, 2009) reported that participants remained active on microblogging sites even though the course was finished.

With respect to the reflections of the students, the findings of this study correspond to the previous research (e.g., Carpenter, 2015; Hamid et al., 2015; Lim & Richardson, 2016; Ricoy & Feliz, 2016; Yakin & Tinmaz, 2013) in which students favored the incorporation of SNSs into their classes in higher education. It is particularly noteworthy that students drew attention to the relationship between such practices and social network literacies, praising the potential contribution of such pedagogical implementation of SNSs on the development of their digital literacies. While the study confirms the foresight of Dunlap and Lowenthal (2009) and corroborates to Tiernan's (2013) finding in terms of 140-character limitation encouraging students to write concisely, it also provides evidence for the argument of Gao and Li (2016), who warned that character restriction might cause

discussions to lack depth. This potential challenge might be overcome soon as Dorsey (2016), the CEO of Twitter, announced future plans for discarding the character limitation in a way which could also preserve the brevity feature of the medium. Finally, pertaining to the students' critical take on Twitter's fast-paced nature, the finding of this study is consistent with the past work (Tur & Marin, 2015), in which the synchronous generation of a large number of tweets negatively was reported to affect students to follow debates. This issue is yet to be under further scrutiny for the purpose of understanding the role of students' digital literacies on their efficient participation in live discussions on Twitter.

Limitations and Recommendations

The contributions notwithstanding, limitations of the present study must be recognized as well. First, the generalizability of the study is limited to the similar course designs since the data was obtained from a course designed and implemented by the author. Second, a similarly designed course in a different subject might produce different results. Therefore, it is suggested that similar hybrid courses of various subjects in different contexts are to be examined. Third, a longer period of engagement with the social media tool might produce different outcomes. However, Akyol, Vaughan, and Garrison (2011) found that effective instructional design and organization of the course and the facilitation of discourse by teacher had a more influential role in creating community of inquiry than course duration. Given that `facilitating discourse` had the highest number of indicators demonstrated in the teaching presence category in the current study, this limitation might have been overcome. Finally, most of the participants in this study knew each other as they had taken classes together before. Even though some students voiced that online meetings helped them get together, the particular role of knowing each other in advance on the formation of an online community of inquiry is not known. This issue warrants further examination along with the following issues: the familiarity of students with one another in face-to-face contexts, the ways such relationships are transferred into virtual spaces, and its role in the formation of an online community of inquiry. On the basis of the evidence provided by the current scholarship, it is suggested that SNSs should be further examined in the next wave of CoI research. Additionally, future studies may employ alternative methodologies, such as corpus-informed approaches and social network analyses for a rich quantitative analysis of the collected data, and/or in-depth interviews to provide a detailed account of the process from the perspective of the students.

CONCLUSION AND IMPLICATIONS

Applying the Community of Inquiry framework by Anderson et al. (2000) in a synchronous multimodal environment, the goal of the present study was to examine the levels of pre-service teachers' social presence and a teacher educator's teaching presence on Twitter as part of a college-level hybrid course. The results revealed that the participation of pre-service language teachers and the instructor respectively indicated social and teaching presences to a great extent on Twitter. This finding moves our understanding of the CoI by signifying that online synchronous spaces have the potential to provide a platform in which an engaging community of inquiry can be constructed, maintained, and achieved. A future co-investigation of the three elements of the CoI framework in synchronous multimodal spaces could offer further insight regarding the dynamics of online teaching and learning.

Introducing the CoI framework to Turkish higher education context, the study also investigated the opinions of pre-service language teachers regarding the implementation of Twitter into their courses. It was found that pre-service teacher participants generally agreed on the reported benefits of the integration of Twitter into the classrooms including a perceived increase in digital literacies. Understanding the use of socio-interactive web spaces and students' opinions of them is worthy of examination since such technologies may have a significant impact on increasing the efficiency of teaching and learning.

The current study has implications for the future of microblogging in higher education mainly in terms of the integration of social network sites into teaching and the use of such technologies in teacher education. As also supported by the current study, the integration of microblogging tools in higher education context, either as a backchannel or a more integrated part of the course, may contribute to the formation and maintenance of a community of practice at least for a semester. Furthermore, the use of microblogging in teacher education in particular may valuable both inside and outside the classroom as it can contribute to the professional development of pre-service teachers both via professional learning networks on Twitter and through a series of online chats (e.g., *#eltchat* for English Language Teachers) designed for professional development purposes. The number and variety of accessible networks may be even more for language teachers who can also reach resources in their target language. Finally, the meaningful implementation of technology into classroom should be explicitly addressed during teacher education and the digital literacy of teacher candidates should be increased for them to gain confidence, create an avenue for future autonomous professional development activities for themselves and personal learning environments for their students.

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