THE IMPACT OF ROLE ASSIGNMENT ON SOCIAL PRESENCE IN ONLINE DISCUSSIONS: A MIXED-METHOD STUDY

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THE IMPACT OF ROLE ASSIGNMENT ON SOCIAL PRESENCE IN ONLINE DISCUSSIONS: A MIXED-METHOD STUDY

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The Impact of Role Assignment on Social Presence in Online Discussions:

A Mixed-Method Study

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DECLARATION OF ORIGINALITY

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ABSTRACT

The Impact of Role Assignment on Social Presence in Online Discussions: A Mixed-Method Study

The purpose of this explanatory sequential mixed-method study is to examine the effect of role assignment strategy on students' social presence in asynchronous online discussions. The participants were 81 preservice teachers who were enrolled in the Instructional Technologies and Material Development course at Boğaziçi University. Asynchronous online discussion activities were designed and implemented in four sections of the course. In two sections of the course, the students were assigned as the experimental group and engaged in online discussion activities designed with the role assignment strategy using the specific roles (starter, moderator, or summarizer); while the control group students completed the discussion activities without the role assignment strategy. The analysis showed that there was a statistically significant difference between the social presence scores of the experimental group and the control group; the mean of the experimental group was higher than the control group. Descriptive analysis of the discussion posts revealed that there were more social presence indicators in the posts of the students who were assigned roles compared to the students who did not have roles. Also, moderators' posts included more social presence indicators than the others' posts; followed by starters, and then summarizers. While moderators used interactive expressions the most; starters and summarizers used cohesive expressions more frequently. This study makes a significant contribution to the literature by providing empirical data about the impacts of role assignment strategy on social presence in asynchronous online discussions.

ÖZET

Çevrimiçi Tartışmalarda Rol Atamanın Sosyal Bulunuşluğa Etkisi: Karma Yöntemli Bir Çalışma

Bu sıralı açıklayıcı karma yöntemli çalışmanın amacı, asenkron çevrimiçi tartışmalarda rol atama stratejisinin öğrencilerin sosyal bulunuşluğu üzerindeki etkisini incelemektir. Veriler Boğaziçi Üniversitesi'nde Öğretim Teknolojileri ve Materyal Geliştirme dersine kayıtlı 81 öğretmen adayından toplanmıştır. Dersin dört şubesinde üç farklı vaka üzerinde eşzamansız çevrimiçi tartışma etkinlikleri tasarlanmış ve uygulanmıştır. Dersin iki şubesinde, öğrenciler deney grubuna atanmışlardır ve belirli roller (başlatıcı, moderatör veya özetleyici) kullanarak rol atama stratejisiyle tasarlanmış çevrimiçi tartışma etkinliklerine katılmışlardır; dersin diğer iki şubesinde ise rol atama stratejisi olmadan tartışma etkinliklerini tamamlamışlardır. Yapılan istatistiksel very analizleri, deney grubu ile kontrol grubunun sosyal bulunuşluk puanları arasında istatistiksel olarak anlamlı bir fark olduğunu göstermiştir; deney grubunun ortalaması kontrol grubundan daha yüksek olarak saptanmıştır. Tartışma mesajlarının analizi, rol verilen öğrencilerin gönderilerinde, rol almayan öğrencilere göre daha fazla sosyal bulunuşluk göstergesi olduğunu ortaya koymuştur. Ayrıca, moderatörlerin mesajları, sosyal bulunuşluk göstergelerini diğer öğrencilerin mesajlarına göre daha sık içermektedir; ardından başlatıcılar ve özetleyiciler gelmektedir. Moderatörler en çok etkileşimli ifadeleri kullanırken; başlatıcılar ve özetleyiciler bütünleştirici ifadeleri daha sıklıkla kullanmışlardır. Bu çalışma sunduğu deneysel veriler ile, asenkron çevrimiçi tartışmalarda rol atama stratejisinin sosyal bulunuşluk üzerindeki etkileri hakkında literatüre önemli bir katkıda bulunmuştur.

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CHAPTER 1

INTRODUCTION

1.1 Significance of the study

The COVID-19 pandemic had a severe impact on education. Since the schools and universities were closed, these institutions replaced face-to-face classes with online learning. Therefore, the importance of online learning had a huge increase, especially after the school closures.

The dynamics of face-to-face learning and online learning are different. The Community of Inquiry framework (CoI) was constructed by Garrison, Anderson, and Archer (2000) to support the learning process in online and blended environments. The CoI framework helps engagement and communication of learners providing deep and meaningful learning in an online learning environment. The CoI framework has three interdependent elements to meet the changing needs of the learners in an online learning process (Garrison et al., 2000). These elements are social, cognitive, and teaching presence.

In this pandemic period, students had to switch to online classes and started to study from home. As a consequence, they feel isolated because of the physical spaces between their instructors and classmates (Williamson, Eynon, & Potter, 2020). Therefore, it was more difficult to encourage the participation and engagement of students in the online lessons. Online discussion is one of the instructional activities to increase student engagement and promote social presence of students in online learning (Aragon, 2003; Rovai, 2002). However, designing meaningful discussion activities to support students' engagement and social presence is a challenging task.

In the studies that adopt the CoI framework, different scaffolding strategies have been used to encourage students' engagement and learning (Darabi, Arrastia, Nelson, Cornille, & Liang, 2010; Gašević, Adesope, Joksimović, & Kovanović, 2015; Hoskins, 2013). However, there is a gap to support students' social presence using scaffolding strategies in the literature. Within the scope of this study, role assignment is hypothesized as one of the scaffolding strategies to support students' social presence in online activities.

In summary, since there is a rapid change in learning environments, it is important to support students' participation and engagement in online learning environments. Supporting students' social presence is necessary to foster participation and engagement (Newberry, 2003; Wise, Chang, Duffy, & del Valle, 2004) considering the mass closures of the schools and the switch to online and digital education formats. Additionally, role assignment as a scaffolding strategy helps to support participation and engagement. However, in the current literature, there is a need for additional research on social presence using scaffolding strategies in asynchronous online learning environments (Lowenthal & Dunlap, 2020). This study aims to fill this gap by exploring the impacts of role assignment strategy on social presence in online discussion activities.

1.2 Purpose of the study

The purpose of this mixed-methods study was to examine the effect of role assignment strategy on students' social presence in asynchronous online discussions. Three different roles were assigned to the students as a scaffolding strategy. Students' social presence was explored through their online discussion posts and answers to the social presence scale (Kim, 2011).

1.3 Research questions

The current study aims to answer the following research questions:

1. To what extent does using role assignment strategy affect students' social presence in asynchronous online discussions?
    a. What is the percentage of social presence indicators used in asynchronous online discussion posts of the experimental and the control group?
    b. Is there a significant difference in social presence scores of the experiment and the control group?
2. How is social presence reflected across different assigned roles when students participate in asynchronous online discussions?
    a. What CoI indicators are present in discussion posts of participants who were assigned to the starter role?
    b. What CoI indicators are present in discussion posts of participants who were assigned to the moderator role?
    c. What CoI indicators are present in discussion posts of participants who were assigned to the summarizer role?

1.4 Research hypotheses

H: Social presence scores of the experimental group will be significantly higher than social presence scores of the control group.

1.5 Organization of the sections

Chapter 2 covers a literature review of the CoI framework and role assignment in online discussions. Chapter 3 consists of the research methodology: research design, the context and participants, data collection instruments, data collection procedures, and data analysis. Chapter 4 includes the results of data analysis. Lastly, the discussion of the findings, recommendations for future research, and the limitations of the study are presented in Chapter 5.

CHAPTER 2

LITERATURE REVIEW

Distance education is an approach for delivering hypermedia-based instruction to foster and support meaningful learning (Khan, 1997). Distance education includes synchronous and asynchronous technologies in learning environments. Synchronous technologies are instant messaging environments, video conference rooms, and other similar tools; asynchronous technologies can be listed as a blog, forum, wiki, and multimedia tools.

Garrison et al. (2000) mentioned that communication tools can have different potentials to support teaching, social, and cognitive presence in asynchronous learning environments. Asynchronous learning tools enable multidirectional communication, relying on written texts and thus providing text-based communication. Text-based communication is preferred in environments where high-level thinking is aimed, considering that it allows time for deep thinking and reflection; therefore, it facilitates meaningful learning (Garrison et al., 2000). Online discussions are one of the effective instructional activities that enable high-level thinking in text-based medium (Yen & Tu, 2011). However, the design issues of online discussion environments such as sociability, cohesion, and social space should be considered to encourage the engagement, participation, and connectedness of learners, and eventually to establish an effective online learning environment (Akcaoglu & Lee, 2016; Aragorn, 2003).

The research in this field showed that online learning environments provide less sociability and interaction, and lack social presence compared to face-to-face learning environments (Rovai, 2002). Despite the argument that online learning is

task-focused and remote, it is important to encourage social interaction between learners (Kreijns et al., 2007; Wickersham & Dooley, 2006). However, this is not an easy task since disadvantages such as physical separation, isolation, lack of personal attention (Besser & Donahue, 1996), and the nature of text-based communication reduce the level of learner satisfaction and the sense of community in online learning environments (Johnson & Aragorn, 2003; Rovai, 2002; Sung & Mayer, 2012). The use of online discussion forums is one of the ways to support interaction and collaboration between online learners (Jacob & Sam, 2010).

Designing asynchronous online discussions is one of the most effective and common activities to support collaboration and interaction among online learners (Jacob & Sam, 2010). Li and Yu (2020) investigated the characteristics of asynchronous online discussions and they mentioned the need of the use of online discussions especially in a pandemic. Several studies were conducted to investigate different variables in online discussions. Some researchers examined the influences of group size on students' interaction (Kim, 2013; Yang, Luo, & Sun, 2020) and social presence (Akcaoglu & Lee, 2016; Chen & Liu, 2020; Lowenthal & Dunlap, 2020), and several researchers used scaffolding strategies to support interaction (Cho & Cho, 2016; Jacob & Sam, 2010; Koskey & Benson; 2016), achievement (Kim & Lim, 2019), collaboration (Jeong & Joung, 2017), and cognitive presence (Avci, 2019; Darabi et al., 2011; Gaševic, Adesope, Joksimović, & Kovanović, 2015; Oh & Kim, 2016) on online discussion activities.

Yang et al. (2020) compared the small-group and whole-class discussions in terms of participation behavior and learning performance. They designed a case-based activity and students analyzed the case in a one-week time period. The findings showed that there was a significant difference between participation behavior and

learning performance comparing small-group and whole-class discussions; small groups participated in the discussion more actively. However, there was a limited impact on the overall learning performance considering the different group sizes. In general, they mentioned that participating in an online discussion helped students to improve their learning performance. Akcaoglu and Lee (2016) examined the relationship between students' perceived social presence and group size in online discussions. They compared small-group and whole-class discussions. Their findings showed that students who were in the small group perceived higher social presence in terms of social space, sociability, and group cohesion.

Darabi et al. (2011) compared four different discussion strategies –structured, scaffolded, debate, and role play– to foster cognitive presence in online discussions. The results indicated that the scaffolded group generated more segments for the resolution phase, and the debate and role-play groups generated more segments for the exploration and integration phases. Avci (2019) also investigated the impacts of role assignment scaffolds in collaborative knowledge-building; students' discussion posts were examined in terms of role assignment and sentence opener scaffolds. The results indicated that the use of scaffolds, especially the combination of role assignment and sentence opener scaffolds supported students' knowledge-building process in online discussion.

2.1 Case-based learning in online discussion activities

Case-based learning is an instructional approach for creating authentic learning environments (Koury, Hollingsead, Fitzgerald, Miller, Mitchem, Tsai, & Zha, 2009; Levin, 2001). The use of cases in learning environments promotes critical reflection and better understanding and enables students to think like teachers who are critical

thinkers and problem-solvers (Greenwood & Parkay, 1989; Koehler, Ertmer, & Newby; 2019; Kowalski, Weaver, & Henson, 1990; Shulman, 1992).

Case-based learning is an effective pedagogical strategy in asynchronous online discussion activities (Koehler, Cheng, Fiock, Janakiraman, & Wang, 2020). The use of case-based learning in asynchronous online discussions enables students to explore complex and real-life questions and generate relevant solutions to identified problems by analyzing and interpreting data (Anderson, Mitchell, & Osgood, 2008; Wu, Hou, Hwang, & Liu, 2013). Discussing a case with a group support collaboration among learners (Hammerness, Darling-Hammond, Bransford, Berliner, Cochran-Smith, McDonald, & Zeichner, 2005) and fosters the development of different perspectives (Şen-Akbulut & Hill, 2020). Missett, Reed, Scot, Callahan, and Slade (2010) examined the learning outcomes of the students in an asynchronous online discussion using the case-based method. The results of the study indicated that the case-based learning method enabled students to be more engaged and improved their learning.

There are many different conceptual frameworks, instructional approaches, and scaffolding strategies to encourage students' participation and engagement in online discussions (Cho & Cho, 2016; Darabi et al., 2010; De Wever et al., 2010). The CoI is a framework that helps to explain and improve online learning environments.

2.2 The Community of Inquiry framework

Supporting the interaction and engagement is significant for designing effective learning experiences in online learning communities (Bernard & Lundgren-Cayrol, 2001; Gašević et al., 2015; Hew & Cheung, 2003; Rovai, 2002). The community of

Inquiry is a theoretical framework that was constructed by Garrison et al. (2000) to support the learning process in online and blended environments (Maddrell, Morrison, & Watson, 2017).

Garrison et al. (2000) first presented the CoI framework that helps learners' communication and engagement providing deep and meaningful learning in an online learning environment (Maddrell et al., 2017). It aims to create collaborative-constructivist learning environments (Cleveland-Innes, Garrison, & Vaughan, 2019) and explains online educational experiences as occurring at the intersection of three dimensions: social, cognitive, and teaching presence (Garrison et al., 2000). These three presences aim to create an effective learning environment providing higher-order learning when they are developed in balance (Cleveland-Innes et al., 2019).

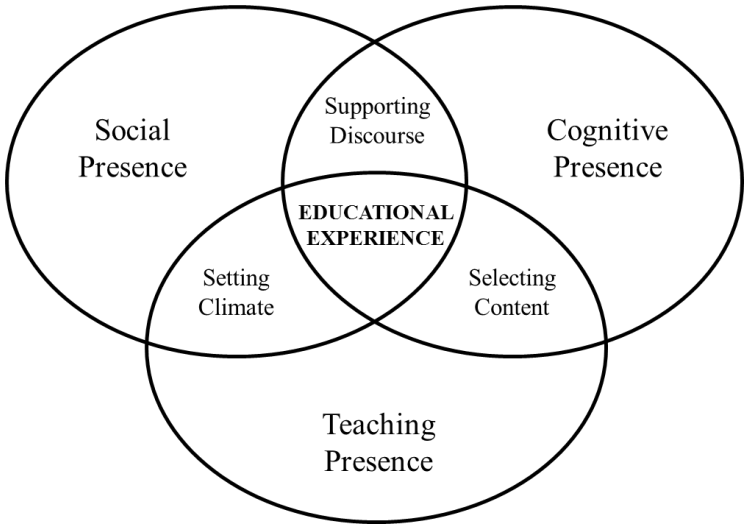

Figure 1. The community of inquiry framework
Source: [Garrison, 2007]

2.2.1 Teaching presence

Teaching presence is described as a binding element and includes design and organization, facilitation discourse, and direct instruction (Swan, Richardson, Ice, Garrison, Cleveland-Innes, & Arbaugh, 2008). The goal of teaching presence is

providing meaningful learning outcomes and higher levels of learning through design, facilitation, and direction (Garrison, Cleveland-Innes, & Fung., 2010). Teaching presence includes cognitive and social processes through designing meaningful educational experiences and educationally worthwhile learning outcomes (Anderson, Rourke, Garrison, & Archer, 2001; Garrison et al., 2000; Cleveland-Innes et al., 2019). It is an important component to create a community of inquiry (Garrison et al., 2010).

Table 1. Operational Definitions of the CoI Presences

Elements	Categories	Indicators
Teaching presence	Design & organization Facilitating discourse Direct instruction	Setting curriculum & methods Shaping constructive exchange Focusing and resolving issues
Cognitive presence	Triggering event Exploration Integration Resolution	Sense of puzzlement Information exchange Connecting ideas Applying new ideas
Social presence	Personal/affective Open communication Group cohesion	Learning climate / risk-free expression Group identity / collaboration Self-projection / expressing emotions

Source: [Akyol & Garrison, 2008]

2.2.1.1 Design & Organization

The first category of teaching presence, instructional course design, addresses structural issues such as setting curriculum, designing methods and assessment, utilizing medium effectively, establishing netiquette, establishing time parameters, and making macro-level comments about course content (Garrison, 2017).

Instructional design is related to planning issues, setting structural parameters, and preparing guidelines for the course (Garrison et al., 2000).

2.2.1.2 Facilitating discourse

Facilitating discourse is the second category of teaching presence. It enables the construction of knowledge and building understanding (Garrison, 2017) by providing learners' interest, motivation, and engagement in a community of inquiry (Anderson et al., 2001). The role of the teachers is not only to be active members but also to encourage and support learner participation, especially helping learners who are less involved in the process (Garrison et al., 2000).

2.2.1.3 Direct instruction

The third category is direct instruction. It includes indicators evaluating the effectiveness of discourse and the educational process (Garrison et al., 2000). This category requires teachers to use their subject matter and pedagogical expertise (Anderson et al., 2001). The responsibility of the teacher is providing intellectual leadership (Anderson et al., 2001) and facilitating discourse by guiding and summarizing the discussion and providing feedback (Garrison, 2000).

2.2.2 Cognitive presence

Cognitive presence is about the involvement of the participants in a research process and the extent to which they construct meaning through continuous reflection and discourse (Garrison et al., 2000). It indicates the ability of each participant in the community to construct meaning through existing communication and is related to how communication is restricted or supported by the medium (Garrison et al.,

2000). Cognitive presence focuses on higher-order thinking processes in contrast to individual learning achievements and includes practice (Garrison, Anderson, & Archer, 2001). It is defined and assessed using the phases of the practical inquiry which is a model of critical thinking (Garrison et al., 2001).

2.2.2.1 Triggering event

It is the initiating phase and the first stage for constructing the knowledge. At this stage, learners identified or recognized a problem, dilemma, or issue (Garrison, 2017). The teacher identifies the learning challenges and tasks as triggering events (Garrison et al., 2001). Teachers' role is to initiate and shape the triggering events; to remove distracting events from the discussion and to ensure that the intended educational outcomes remain in focus (Garrison et al., 2001; Garrison, 2017).

2.2.2.2 Exploration

The second stage of cognitive presence is exploration. It is about understanding the nature of the problem and seeking relevant information and ideas (Garrison, 2017). At this stage, learners switch between the individual's private, reflective world and social exploration of ideas (Garrison et al., 2001). Exploration is the search for information, knowledge, and alternatives to become the situation or problem meaningful for each learner (Garrison et al., 2000) In this phase, learners explore different resources and start to produce solutions and explanations for the problem (Chen, Lei, & Cheng, 2019) using brainstorming or literature searches (Garrison, 2017).

2.2.2.3 Integration

The third phase of practical inquiry is integration. It is a more focused and structured phase that learners start to make sense of information by describing information, integrating ideas, and constructing meaning to reach meaningful learning outcomes (Chen et al., 2019; Garrison, 2017). In this phase, learners start to assess the quality of possible solutions and ideas considering how well they identify and connect the issues (Garrison et al., 2001). This is the most challenging step of cognitive presence requires a deep understanding and identifying misconceptions by explaining, comparing, connecting, synthesizing, and elaborating (Chen et al., 2019).

2.2.2.4 Resolution

The fourth stage is the resolution of a dilemma or problem with direct or vicarious actions (Garrison et al., 2001) and exploring a solution to the identified problem (Garrison, 2017).

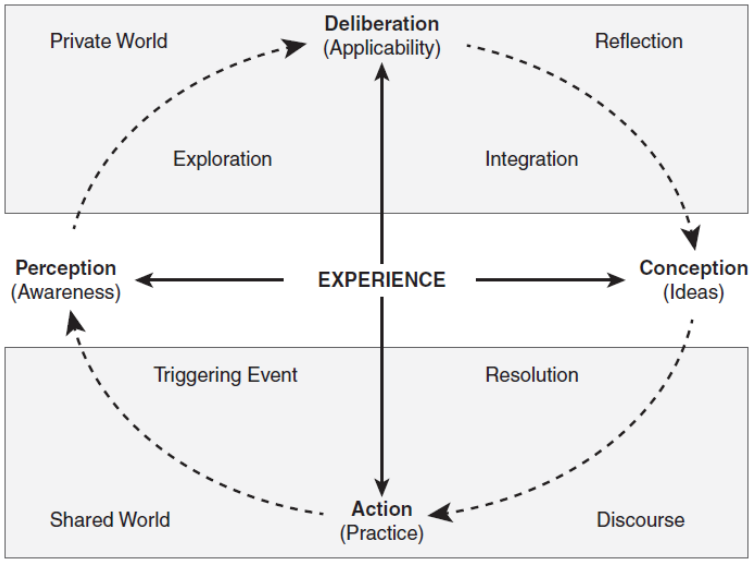

Figure 2. Practical inquiry model
Source: [Garrison, 2017]

It includes testing the effectiveness of the hypothesis through observation or experiment (Chen et al., 2019). At the end of this phase, new questions and issues can occur that require focusing on new problems and issues which encourages continuous learning (Garrison, 2017).

2.2.3 Social presence

Social presence is one of the three elements of the community of inquiry framework that investigates how people communicate in an online learning environment (Lowenthal, 2009). Social presence helps to build a sense of community by allowing learners to show up as themselves socially and emotionally (Garrison et al., 2000; Boston et al., 2009), and supports to establish relationships and a sense of belonging that is important in a learning experience to promote satisfaction (Richardson, Maeda, Caskurlu, & Lv, 2017) and engagement (Cleveland-Innes et al., 2019). The goal of social presence is to create conditions in which questioning and quality interaction will occur to obtain learning outcomes collaboratively (Garrison & Arbaugh, 2007).

In the studies conducted to support social presence, the challenges in a communication medium, such as the absence of nonverbal and relational cues that affect the social process of teaching and learning in online discussions have been investigated extensively (Richardson & Lowenthal, 2017). Studies have shown that social presence can affect the learning experience, participation, and satisfaction of students (Jorge, 2010; Mazzolini & Maddison, 2007; Swan & Shih, 2005; Tu & McIsaac, 2002; Weaver & Albion, 2005 as cited in Richardson & Lowenthal, 2017).

Several studies were conducted to examine how social presence is associated with engagement, learning, and satisfaction. For example, Gunawardena and Zittle

(1997) investigated if social presence is a predictor of learner satisfaction in a computer-mediated environment. The study indicated that social presence may be a strong predictor of learner satisfaction. Richardson and Swan (2003) investigated the effects of social presence on students' learning and satisfaction in online learning environments. They found that social presence is a significant predictor of students' learning and satisfaction. Newberry (2004) studied the effects of social presence on engagement and satisfaction in online learning environments. The results of the study indicated that social presence is associated with satisfaction; engagement is similarly related to satisfaction. The study of Akyol and Garrison (2008) also found that students' social presence is a factor that affects course satisfaction and satisfaction with the instructor. Richardson et al. (2017) conducted a meta-analysis to investigate social presence in terms of students' satisfaction and learning in online environments. After they evaluated 25 studies, the results showed that there is a moderately large positive correlation between both social presence and perceived learning, and social presence and satisfaction. On the contrary of these studies, the results of Wise et al.'s (2004) study showed that social presence has no effect on learners' satisfaction, engagement, and perceived learning.

After the worldwide impacts of the COVID-19 pandemic in educational settings, research for emotional elements in online learning gained importance (Jiang & Koo, 2020). Korpershoek, Harms, Boer, Kuijk, & Doolaard (2016) stated that emotional relationships between instructor and students in face-to-face learning are crucial to reach learning outcomes. Jiang and Koo (2020) also proposed that fostering emotional presence and relationships is important in online learning environments.

Emotion is a significant factor in student adjustment to the role of online learner (Cleveland-Innes, Garrison & Kinsel, 2007), the development of online

community (Perry & Edwards, 2005), and successful learning (Cleveland-Innes & Campbell, 2012). Garrison et al. (2000) proposed that emotional expression is a part of social presence in online learning environments. Derks, Fischer, & Bos (2008) conducted an empirical study to examine the impacts of emotional expressions in various modes of communication. The findings indicated that emotional expressions were quite similar in online and face-to-face learning environments.

Lipman (2003) proposed that emotional expressions and thinking skills should be evaluated together in online learning to develop reasoning and judgment. In addition, Lipman (2003) presented emotional expressions as one of the three categories of social presence in the CoI framework. Cleveland-Innes and Campbell (2012) further stated that emotional presence should be a unique presence, and they defined emotional presence as the fourth dimension of the CoI framework. Also, the results of their study indicated that emotional presence is essential in online learning.

2.2.3.1 Social presence in online discussions

Several studies were conducted on social presence and online discussions. Tu and McIsaac (2002) stated that social presence is a vital element in online discussions. They conducted a study to investigate the relationship between social presence and interaction in an online discussion environment. The results of the study showed that the three dimensions of social presence that are social context, online communication, and interactivity were important categories to support the sense of community among students; and social presence significantly affects students' interaction in online discussions.

Swan and Shih (2005) conducted a mixed-methods study to investigate the development of social presence in online discussions. In the study, the students who

perceived high social presence used their own presence to increase the level of social presence of their peers. The findings of the study showed that there was a strong relationship between social presence and satisfaction in online discussions. Also, the results indicated that the design of the course may also be effective on students' social presence.

Lowenthal and Dunlap (2020) conducted a mixed-methods study to examine social presence in asynchronous online discussion activities. They mentioned several variables such as instructional task, previous relationships, and group size that affect the level of social presence and how it is supported. Considering the group size for this study, the participants in small group discussions, which consisted of 4-5 students, had higher social presence density than the students in large-group discussions. Also, they mentioned that the instructor's intervention may affect the development of social presence in online discussion groups.

Rand (2017) conducted a study to investigate the use of role assignment strategy to increase social presence and discussion quality in online discussions. The three roles –starter, responder, and wrapper– were used to guide online discussions. The findings of the qualitative analysis indicated that students in the role assignment group had a higher discussion quality. However, the analysis of the CoI questionnaire indicated no statistically significant difference between the groups in terms of discussion quality and perceived social presence.

2.2.3.2 The categories and indicators of social presence

Researchers developed different formats to determine, measure, and analyze social presence in online learning environments. The two most used ways to measure social presence are self-reporting, such as surveys (Arbaugh et al., 2008; Gunawardena,

1995; Gunawardena & Zittle, 1997; Kim, 2011; Richardson & Swan, 2003; Tu, 2002; Wise et al., 2004), and behavioral indicators (Richardson et al., 2015; Rourke, Anderson, Garrison, & Archer, 2001; Swan & Shih, 2005; Swan, 2003). For example, Gunawardena and Zittle (1997) developed a self-report questionnaire for the study on social presence and computer-mediated communication (CMC). Tu (2002) criticized the weaknesses of the questionnaire used by Gunawardena and Zittle (1997) considering the variables in research such as instructional tasks, communication styles, privacy, and social relationships. Thus, Tu (2002) developed "The Social Presence and Privacy Questionnaire (SPPQ)" using the CMC attitude instrument (Steinfield, 1986) and perceived privacy (Witmer, 1997). Although researchers have different focuses on studying social presence over the years, the two most used formats of measurement instruments that have not changed are self-reporting and behavioral indicators.

In this study, Rourke et al.'s (2001) categories and indicators are used for the design and analysis of online discussion activities. Unlike the other researchers who work on measuring the social presence, Rourke et al. (2001) measured social presence through analyzing online discussions. They identified three categories and twelve indicators for these categories to measure social presence in online discussions (see Table 2).

Table 2. Categories and Indicators of Social Presence

Category	Indicators	Definition of Indicators
Affective Responses	Expression of emotions	Conventional expressions of emotion, or unconventional expressions of emotion, includes repetitious punctuation, conspicuous capitalization, emoticons
	Use of humor	Teasing, cajoling, irony, understatements, sarcasm
	Self-disclosure	Presents details of life outside of class, or expresses vulnerability
Interactive Responses	Continuing a thread	Using the reply feature of the software, rather than starting a new thread
	Quoting from other messages	Using software features to quote others entire message or cutting and pasting sections of others' messages
	Referring explicitly to other messages	Direct references to contents of others' posts
	Asking questions	Students ask questions of other students or the moderator
	Complimenting, expressing appreciation	Complimenting others or contents of others' messages
	Expressing agreement	Expressing agreement with others or content of others' messages
Cohesive Responses	Vocatives	Addressing or referring to participants by name
	Addresses or refers to the group using inclusive pronouns	Addresses the group as we, us, our
	Phatics/Salutations	Communication that serves a purely social function; greetings, closures

Source: [Rourke, Anderson, Garrison, & Archer, 2001]

2.2.3.3 Affective responses

The first category, affective responses, is the ability of learners to share their feelings, beliefs, values, and attitudes through a text-based environment using

emoticons or parenthetical metalinguistic cues (Gunawardena, 1995). Garrison et al. (2000) defined the indicators of affective responses as the expression of emotions, use of humor, and self-disclosure. Researchers argued that expression types of socio-emotional communication such as body language, facial expressions, and vocal intonations cannot be observed in an online environment (Rourke et al., 2001). Therefore, the expression of emotions is an important indicator to set an affective or emotional climate in online learning (Garrison, 2017).

Expression of emotions can be observed when visual cues or vocal intonations are not present in online discussion environments (Garrison, 2017). It is defined as conventional or unconventional expressions of emotion which include emoticons, punctuation, and capitalization (Rourke et al., 2001). Humor is another factor that aims to minimize social distance and convey goodwill (Garrison, 2017; Rourke et al., 2001). The use of humor can be observed as joking, cajoling, teasing, irony, sarcasm, or understatement (Rourke et al., 2001).

The last indicator of affective responses is self-disclosure. Self-disclosure includes social attraction and bonding among learners (Rourke et al., 2001). It is defined as the more learners know about others, the more they create a trustful, responsive, and supportive learning environment (Garrison, 2017). Presenting the details of individuals' lives and expressing vulnerability are examples of self-disclosure (Rourke et al., 2001).

2.2.3.4 Interactive responses

The category of interactive responses is related to building a sense of group commitment (Swan et al., 2008). It is about establishing a trustworthy and supportive climate to provide meaningful interaction (Garrison, 2017). It is built through a

process of acknowledgments, such as replying to others' messages, quoting from others, and referring directly to others' messages; asking questions, complimenting others, expressing agreements and disagreements (Garrison, 2017; Lowenthal & Dunlap, 2020; Rourke et al., 2001), thereby, supporting the engagement and participation of learners in online discussion (Garrison, 2017).

2.2.3.5 Cohesive responses

Group cohesion is about the activities that help to build and sustain a sense of bonding in a group (Rourke et al., 2001). Rourke et al. (2001) defined cohesive responses with three indicators: vocatives, phatics and salutations, and addressing the group using inclusive pronouns. Cohesive responses start with simple behaviors such as vocatives that are addressing others by name. Several studies in literature showed that there is a relationship between addressing others by name and behavioral, affective, and cognitive learning (Christenson & Menzel, 1998; Gorham, 1988; Gorham & Zakahi, 1990; Sanders & Wiseman, 1990).

Using inclusive pronouns to address the group is another way to establish a social presence. Addresses the group as "we, us, our" support the feeling of closeness and commitment in an online discussion group (Christenson & Menzel, 1998; Gorham, 1988; Gorham & Zakahi, 1990; Sanders & Wiseman, 1990). Phatics and salutations are identified as communication that includes sharing feelings, greetings, or closures (Rourke et al., 2001). That means, communicating socially rather than giving information to others. The indicators of cohesive responses support the collaboration, knowledge construction, and increase the quality of learning and outcomes when learners start to see themselves as a member of the community of inquiry (Garrison, 2017).

2.2.3.6 Scaffolding social presence

Scaffolding is defined as the instructional support of advanced individuals to less experienced learners (Vygotsky, 1978). Vygotsky emphasized the importance of social interaction in collaborative learning activities. Scaffolding is viewed as a facilitator that promotes social interaction and collaboration between group members using different methods (Pata, Sarapuu, & Lehtinen, 2005).

Monitoring students' progress, encouraging participation, providing feedback are some of the forms to apply scaffolding strategies in different learning environments (Cho & Cho, 2016). In the studies that explore the Community of Inquiry, different scaffolding strategies have been used to encourage students' engagement and learning (Darabi et al., 2010; Gaševic et al., 2015; Hoskins, 2013). Several studies used scaffolding strategies to support cognitive presence (Darabi et al., 2010; Gaševic et al., 2015). However, there is a gap to support students' social presence using scaffolding strategies in the literature. Role assignment is one of the scaffolding strategies to support students' interaction and learning in online activities. Several studies showed that role assignment strategy support students' engagement in asynchronous online discussions (De Wever, Van Keer, Schellens, and Valcke, 2009; Gaševic et al., 2015; Ghadirian et al., 2019; Xie, Yu, & Bradshaw, 2014).

2.3 Role assignment in online discussions

Designing online discussion activities is a common strategy to support collaboration and engagement between learners (De Wever et al., 2010). Since the CoI framework aims to create engaged learners in collaborative-constructivist learning environments, fostering online group discussions is valuable to help the engagement and communication of learners. Grouping learners in online discussion activities enable

them to work together, solve problems and offer preliminary solutions collaboratively and reach a shared understanding (Cecez-Kecmanovic & Webb, 2000). As Weinberger et al. (2005) stated, working as a group is crucial to provide effective learning and collaboration. Considering the group size in online discussions, Akcaoglu and Lee (2016) suggested that if the member of the groups' increases, it results in more complex teamwork. Working in a small group positively affects the interaction between learners and their willingness to be active in online discussions (Lowry et al., 2006). However, several studies showed that grouping learners in asynchronous online discussions are not enough to provide interaction and collaboration among group members (Dillenbourg, 2002; Vonderwell, 2003; Weinberger et al., 2005).

Role assignment is a system of functions that guides learners' behaviors and promotes interaction between the group members by playing written roles in an online discussion environment (Cesareni et al., 2016). It is a type of collaboration script that aims to improve learning (Strijbos & Weinberger, 2010). Taking a role is defined as a position in a group that has responsibilities toward each group member (Hare, 1994) and it facilitates an individual's awareness and participation, and the total performance of the group (Strijbos & Weinberger, 2010).

2.3.1 Scripted roles

Scripted roles are about structuring roles and activities to support collaborative and meaningful learning in online discussion activities (Strijbos & Weinberger, 2010). Scripted roles aim to help the learning processes and the outcomes by providing instructional support for online learning environments (Cesareni et al., 2016). Researchers identified different scripted roles in their studies.

Schellens, Van Keer, and Valcke (2005) assigned four scripted roles to the students in their study. These roles were a) moderator, who moderates the discussion, answers questions, gives advice, and encourages active participation; b) theoretician, who considers all theories throughout the discussion and makes sure that sufficient information is provided; c) summarizer, who summarizes the discussion considering every aspect and point of the topic; and d) source searcher; who looks for additional sources to look further. Results of the study showed that even if there was no significant difference between the role and the no role groups in terms of their knowledge construction levels, the students who had the summarizer role had higher levels of knowledge building. De Wever et al. (2009) assigned the "starter" role to particular students in addition to these four roles. They identified the starter who is responsible to start the discussion and manage the discussion by giving new impulses and points when it is needed. They found that assigning roles to learners had a significant impact on their social knowledge construction. Furthermore, their results showed that assigning roles to learners at the beginning of the discussion was the most effective method for students to have interiorized the skills with related roles and to be competent enough to join the discussions in a more natural way.

Xie, Yu, and Bradshaw (2014) assigned the moderator role to investigate the moderator-to-peer relationship in asynchronous online discussions. Results of the study indicated that the participation quantity, diversity, and interaction attractiveness of the moderators were significantly higher than the other students. Ghadirian, Salehi, and Ayub (2019) conducted a study to examine the impacts of peer moderator role on students' participation in online discussions. The results showed that the participation quantity and patterns of students in a peer moderator role were significantly higher than the others. In the study of Avci (2019), student participation

in the online knowledge-building process was investigated using a role assignment strategy. Besides the role assignment strategy, sentence openers are used as another scaffold. The results showed that the use of scaffolds, especially the combination of these two scaffolds supported students' knowledge-building process in higher cognitive levels.

2.3.2 Role assignment and the CoI framework

Several researchers explored the relationship between role assignment and the elements of CoI. Olesova and Lim (2017) conducted a study to investigate the effects of role assignment on cognitive presence in asynchronous online discussions by using the starter, skeptic, and wrapper roles. Their results indicated that there was a significant relationship between the level of cognitive presence and the role assignment. They concluded that scripted roles can be an effective strategy for efficient learning processes and outcomes in online discussion environments.

De Wever et al. (2010) conducted a study investigating the impacts of five roles that are a starter, summarizer, moderator, theoretician, and source searcher using asynchronous online discussion groups. The findings of their study indicated that role assignment fosters cognitive presence by supporting students' decision-making and knowledge-building process. Wise, Saghafian, and Padmanabhan (2012) assigned ten different roles to examine the different functional responses of the roles that are giving direction, producing new ideas, responding, the use of theory, bringing in a source, and summarizing. The results showed that assigning roles supports cognitive presence while promoting students' higher-order thinking

processes; therefore, the use of role assignment is a powerful strategy to structure and support online discussions.

Darabi et al. (2010) investigated four different online discussion strategies to foster students' cognitive presence. These strategies were named structured, scaffolded, debate, and role play. The findings indicated that scaffolded strategy was highly associated with the resolution phase of cognitive presence, and the debate and role-play strategies were highly associated with exploration and integration phases of cognitive presence. That means, the scaffolded group generated more segments for the resolution phase, and the debate and role-play groups generated more segments for the exploration and integration phases. Gaševic et al. (2015) investigated teaching presence approaches in CoI while fostering students' cognitive presence. They used two strategies: self-regulated learning through externally-facilitated regulation scaffolding and computer-supported collaborative learning through role assignment. Results of their study indicated the significant positive effects of the two strategies on the level of students' cognitive presence. The findings supported that assigning roles facilitates a high level of cognitive presence.

Farrow, Moore, and Gašević (2021) investigated the effects of role assignment on the depth and quality of the discussion in an asynchronous online discussion environment. They used the phases of cognitive presence to measure the depth and quality of the discussions. The two different roles were used: Research expert and practicing researcher. The results showed that there was a statistically significant difference between the students who were in the expert role and those who were not; the experts had higher scores than the others. The findings of the study

supported that role assignment can be an effective strategy in online discussion environments.

Looking at all these findings from the literature, the current study hypothesized that role assignment, when designed properly, will be an effective scaffolding strategy to support social presence in online discussion activities. This study examines the impacts of role assignment strategy on students' social presence in an online discussion environment in higher education settings. In accordance with this purpose, this study aims to answer the following research questions:

1. To what extent does using role assignment strategy affect students' social presence in asynchronous online discussions?
    a. What percentage of social presence indicators are used in asynchronous online discussion posts of the experimental and the control group?
    b. Is there a significant difference in social presence scores of the experiment and the control group?

2. How is social presence reflected across different assigned roles when students participate in asynchronous online discussions?
    a. What CoI indicators are present in discussion posts of participants who were assigned to the starter role?
    b. What CoI indicators are present in discussion posts of participants who were assigned to the moderator role?
    c. What CoI indicators are present in discussion posts of participants who were assigned to the summarizer role?

CHAPTER 3

METHOD

The purpose of this study is to examine the effect of role assignment strategy on students' social presence in online discussions. In this chapter, the following sections were covered: (1) research design, (2) the context and participants, (3) data collection instruments, (4) data collection procedures, and (5) data analysis.

3.1 Research design

This study was designed as an explanatory sequential mixed-methods design (Creswell & Plano-Clark, 2018). Explanatory sequential mixed-method is a research design that helps to explain and elaborate quantitative findings with qualitative data (Creswell, 2014). Therefore, the aim of using the selected design was to improve a more in-depth understanding of the quantitative data. The quantitative dataset included participants' responses to the Social Presence Scale and descriptive statistics of social presence indicators in asynchronous online discussion posts. Participants' online discussion posts formed the qualitative dataset of the study.

The independent variable of the study was the use of role assignment strategy in discussion activities. The dependent variable of the study was students' social presence in asynchronous online discussions.

3.2 Context and participants

The participants of the study were selected using the purposeful sampling method (Creswell, 2012) based on the criteria of being a pre-service teacher and taking an online course including online discussion activities.

The participants of the study were 81 preservice teachers who were enrolled in the Instructional Technologies and Material Development course at Boğaziçi University. Participants took the course online in the Spring 2021 semester. The participants' age range was 22-24. The course was about the concepts and principles of educational technology as an integrated part of the teaching and learning process. The course aimed to develop an understanding about the concepts and principles of technology-enriched teaching and learning and improving technological skills to design instructional materials. The course also had lab sections that helped pre-service teachers to combine the theoretical knowledge and technological skills necessary to complete the activities.

The researcher conducted the study with participants in four sections of the course. In two of the sections, the participants engaged in online discussion activities designed with the role assignment strategy; while the other two sections completed the discussion activities without the role assignment strategy. The sections were randomly assigned to the experimental group or the control group. The instructor of the two sections (experimental group) that included role assignment strategy and the instructor of the other two sections (control group) that did not include role assignment strategy were different. However, the design of the course including all learning activities, schedule, and grading was the same; the only difference was the use of role assignment strategy in discussion activities.

3.2.1 Design of the online discussion activities

In this study, online discussion activities were used to support and observe participants' social presence. Throughout the study, participants discussed three

different cases on the university's Learning Management System (Moodle) within their small groups.

Several roles were assigned to the participants weekly to provide them with the opportunity of experiencing different roles. These roles were described as the starter, moderator, and summarizer within the scope of the study. The responsibilities and strategies for the roles were designed based on social presence indicators to support participants' affective expression, open communication, and group cohesion (see Appendix A, B, and C for detailed guides).

Table 3. Responsibilities of the Roles

Roles	Responsibilities	Example Strategies
Starter	Initiate the discussion Maintain positive tone Encourage others in the discussion	Direct questions about the topic Start with greetings to the post Add new points to the discussion
Moderator	Ensure the continuity of the discussion Maintain positive tone Encourage others for sharing ideas	Connect the ideas in different posts Clarify the conflicts in different posts Address the group members using their names
Summarizer	Summarize key ideas Maintain positive tone Make conclusions	Identify the opposite views Offer solutions End the week with closures

The small group discussions included 6 participants. That means, each discussion proceeded in groups of 6 participants for each case. Each case was discussed for two weeks on Moodle. In the first week of each case, the first three participants had a specific role (starter, moderator, or summarizer) and the other three participated as participants; in the second week of each case, the other three participants had a specific role in each group. Thus, every participant had a role in

each discussion case. During all online discussions, the members of the groups were the same and their roles changed.

3.2.2 Online discussion activities

During the study, participants participated in three different discussion activities about technology integration in education through Moodle. The cases were selected from the book of Chen and McPheeters (2012) entitled "Cases on Educational Technology Integration in Urban Schools". The selected cases were "Ch1: Use of Technology to Motivate Students", "Ch25: Educational Technology in a Novice Science Teacher's Classroom", and "Ch 28: Issues & Challenges in Preparing Teachers to Teach in the Twenty-First Century". Chapter 1 is about providing the best use of technology to motivate students. Chapter 25 includes the barriers and strategies to overcome those barriers to create technology-enriched classroom environments. Chapter 28 examines the impact of technology-infused social studies pedagogy courses had on pre-service teachers' willingness to use the computer and online tools, and how they used them in classrooms.

The discussions continued in groups of 6 participants. Each discussion activity continued for two weeks with the same group members (see Table 4). During the case activities, participants participated in discussions on Moodle. For each case, it was expected from participants to actively participate in the discussions by creating online discussion posts for two weeks considering their roles (see Table 5). The instructors prepared guiding questions for the discussion activities and created discussion threads for each group. The participants were not able to see other groups' posts to avoid affecting the direction of the discussions.

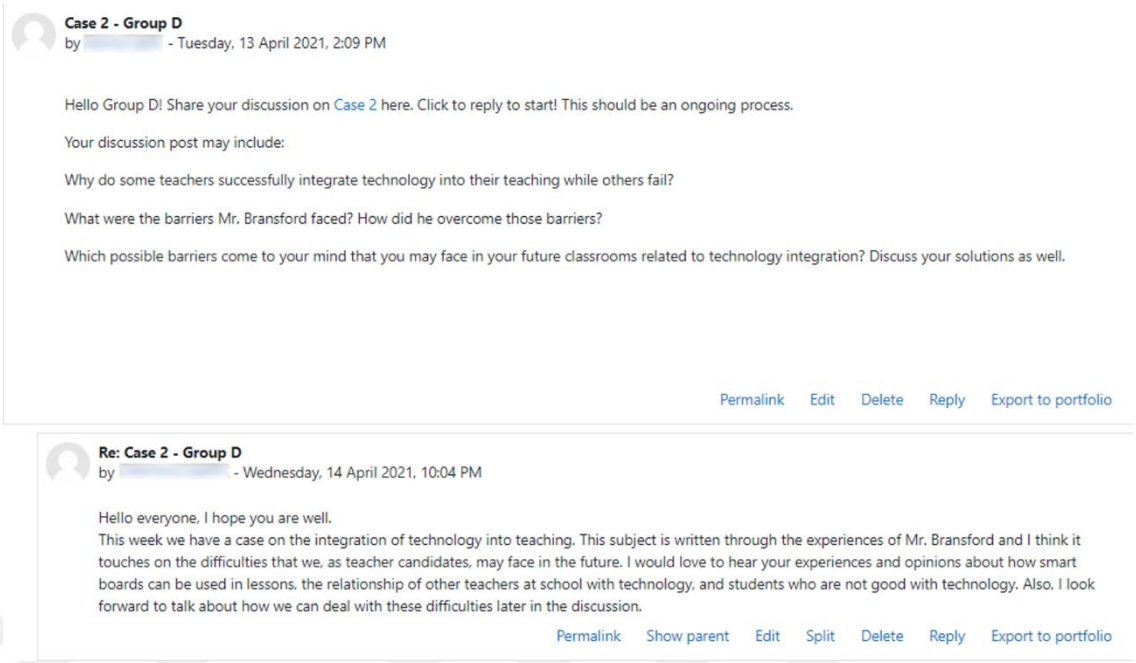

Figure 3. An example of the guiding questions of the instructor for Case 2

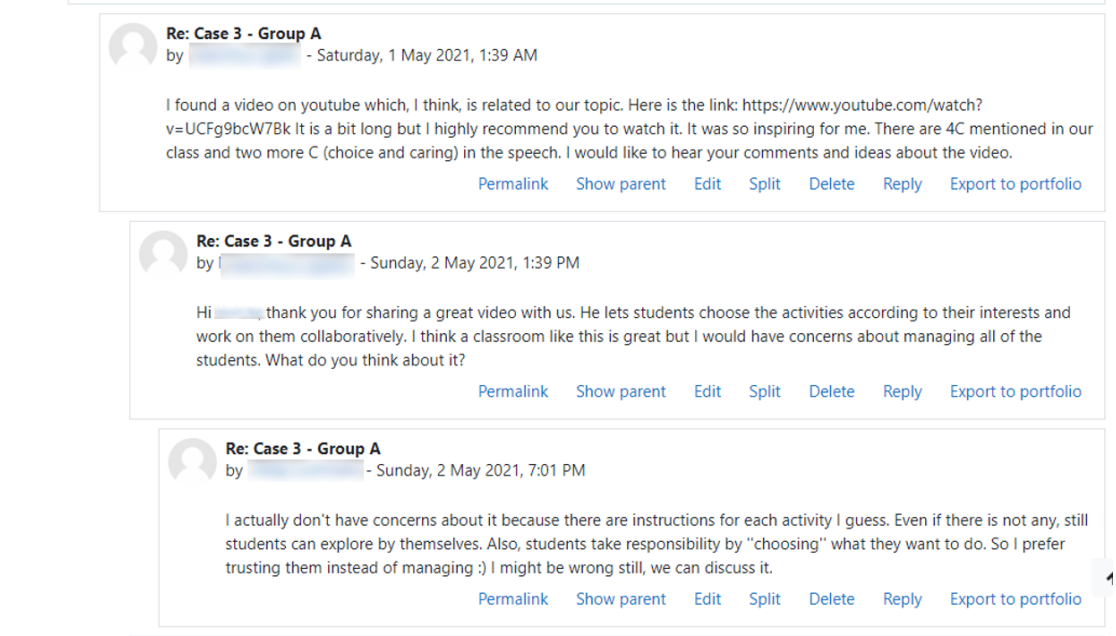

Figure 4. An example of the Moodle logs of Group A for Case 3

Table 4. Details of the Case Activities

Period	Case	Case content
From 1st to 2nd week	Use of Technology to Motivate Students	the best use of technology to motivate students
From 3rd to 4th week	Educational Technology in a Novice Science Teacher's Classroom	the barriers and strategies to overcome those barriers to create technology-enriched classroom environments
From 5th to 6th week	Issues & Challenges in Preparing Teachers to Teach in the Twenty-First Century	the impact of technology-infused social studies pedagogy courses had on pre-service teachers' willingness to use the computer and online tools, and how they used them in classrooms

Table 5. Overview of the Online Discussion Activities

Week	Date	Agenda	Assignments	Deliverables
#1	March 23	Online discussion training		
#2	March 30	In-class discussion (Online discussion training)	Start case 1-Discussion on Moodle	Online discussion posts
#3	April 6	Case 1-wrap-up (25 min)	Keep discussion case 1 (new roles*)	Online discussion posts
#4	April 13	Case 1-final wrap-up (20 min)	Start case 2-Discussion on Moodle	Online discussion posts
#5	April 20	Case 2-wrap-up (25 min)	Keep discussion case 1 (new roles*)	Online discussion posts
#6	April 27	Case 2-final wrap-up (20 min)	Start case 3-Discussion on Moodle	Online discussion posts
#7	May 4	Case 3-wrap-up (25 min)	Keep discussion case 1 (new roles*)	Online discussion posts
#8	May 18	Case 3- final wrap-up (20 min) Social Presence Scale		Online discussion posts

3.2.3 Assignment of the roles

During the online discussion activities, three different roles were assigned to participants. These roles were the starter, moderator, and summarizer. The participants who had the roles were expected to consider their roles while writing the discussion posts. Starters were responsible to start the discussions and encourage the other group members to contribute to the discussions using a positive tone in their posts. Directing questions to the group members about the topic, using a sense of humor, starting with greetings to the post, using inviting words such as “we, us, our”, and adding new points to the discussion were the corresponding strategies of starters’ responsibilities.

Moderators’ responsibilities were to write their posts in a positive tone, provide the continuity of the discussions, and give the necessary support to the other group members to share their ideas. Connecting the ideas in different posts, reactivating the discussion when it is necessary, expressing appreciation, clarifying the conflicts in different posts, addressing the group members using their names, and caring for every member’s ideas are the strategies moderators used.

Summarizers were responsible to make a summary of the key ideas and conclude the discussions using a positive tone. The corresponding strategies of the summarizer role were connecting the members’ posts with the topic by giving the references of the related posts, identifying the opposite views, offering solutions, and ending the week with closures. After the online discussion activities for each case, Social Presence Scale was sent to the participants via e-mail.

In the control group sections, the discussion activities were applied in the same way without using the role assignment strategy.

3.3 Data collection instruments

The quantitative data of the study were collected through the Social Presence scale (Kim, 2011) and the qualitative data were collected using participants' online discussion posts.

3.3.1 Social presence scale

Since this study aimed to observe the effect of role assignment strategy on participants' social presence in online discussion activities, a scale was used to measure and compare the experimental and the control group participants' social presence after attending the course. The Social Presence scale was a five-point Likert scale from 1 (*strongly disagree*) to 5 (*strongly agree*) and it was developed by Kim (2011) (See Appendix D). The scale is designed to measure learners' social presence in distance higher education. Therefore, it is suitable for this study. The scale has 19 items; the maximum score from the scale is 95 points and the minimum score is 19 points. The content validity was checked by 16 experts who are experienced in the fields of educational technology, counseling, and adult and lifelong education in order to review the scale items. Cronbach's alpha for internal consistency reliability for the four dimensions was ranged from 0.816–0.86. Thus, the results indicated that the scale is reliable to measure social presence (Kim, 2011).

3.3.2 Discussion posts

The discussion posts created by participants in three discussion activities throughout 6 weeks constituted data for qualitative analysis of social presence. Participants created posts considering their roles in an asynchronous online platform. Three different cases were used for discussion activities. Each case was discussed for two

weeks on Moodle. At the end of the study, the discussion posts of the participants for 6 weeks were used as the qualitative data of the study.

3.4 Data collection procedure

Before the data collection process, ethical approval was obtained from the Ethics Committee in Social Sciences and Humanities (SOBETIK) of Boğaziçi University (see Appendix F), and a consent form was sent to the participants (see Appendix G and H). The consent form included the purpose of the study, the importance of participation, and the procedure of the study. Before starting the discussion activities, a training session was held for the experimental group and the control group. In the experimental group, the training session was held to explain the discussion activities, responsibilities, and corresponding strategies for the roles; in the control group, general rules that participants should pay attention to in the online discussions were practiced (see Table 6). The participants also engaged in a training activity during the first week of the course. The case was about meaningful learning with technology. The discussion posts from this activity were not treated as data.

Table 6. Overview of Data Collection Procedure

Duration	Experimental Group	Control Group
First week	Introducing the Moodle, course content, and online discussion activities The training and practice discussion activity for the introduction of the roles	Introducing the Moodle, course content, and online discussion activities The training and practice discussion activity on general rules participants should pay attention to in the online discussion
For six weeks	Online group discussions on three different cases using role assignment	Online group discussions on three different cases
Last two weeks	Social presence scale	Social presence scale

3.5 Data analysis

3.5.1 Quantitative analysis

The first research question (To what extent does using role assignment strategy affect students' social presence in asynchronous online discussion activities?) was answered using the data from the Social Presence Scale and the participants' discussion posts. At first, descriptive statistics and the normal distribution of social presence scores were examined. Depending on this analysis, it was decided which statistical test, parametric or nonparametric, to be used for the research question 1.b. In order to answer research question 1a, participants' online discussion posts were analyzed. In the following part, the process of data analysis is explained in detail for the research questions 1a and 1b.

Research question 1a (What percentage of social presence indicators are used in asynchronous online discussion posts of the experimental and the control group?) was answered using discussion posts. Online discussion posts from three different discussion activities were used to find the frequency of the social presence indicators and categories in the experimental group and the control group. The discussion posts were coded based on the categories and indicators of social presence developed by Rourke, Anderson, Garrison, and Archer (2001).

For research question 1b (Is there a significant difference in social presence scores of the experiment and the control group?), the answers of participants on the Social Presence Scale items were collected and scored considering the Likert-type questions averaged by variable to find quantitative ratings. The mean scores of the experimental group and the control group were compared. Since the social presence

scores of the experimental and control groups were normally distributed, the parametric Independent Samples t-Test was conducted to see whether there is a significant difference among participants' social presence scores.

3.5.2 Qualitative analysis

In order to answer the second research question (How is social presence reflected across different assigned roles when students participate in asynchronous online discussions?), qualitative analysis was conducted; social presence indicators were examined in online discussion posts using content analyses. Content analysis is a research technique used by researchers to analyze text (Carley, 1993; Powers & Knapp, 2006). It is a systematic approach for coding and categorizing textual information (Mayring, 2000). The purpose of content analysis is to determine the frequency of words and concepts (Carley, 1993). In this study, the discussion posts were coded based on the categories and indicators of social presence developed by Rourke, Anderson, Garrison, and Archer (2001) to answer the research questions what CoI indicators are present in discussion posts of participants who were assigned to the starter/moderator/summarizer role. The level of social presence was examined in terms of the assigned roles through investigating the discussion posts for the experimental group. The frequency and percentage of categories and indicators of social presence in terms of assigned roles were measured for each role. Then, the use of social presence indicators was explored for each role in detail considering the responsibilities of the roles.

Table 7. Data Analysis of the Research Questions

Research Question	Instruments	Period	Data Analysis
To what extent does using role assignment strategy affect students' social presence in asynchronous online discussions?	Social Presence Scale (Kim, 2011) and Discussion Posts	After the intervention (7th week) and during the intervention (From 1st to 6th week)	Quantitative analysis
How is social presence reflected across different assigned roles when students participate in asynchronous online discussions?	Discussion Posts	During the intervention (From 1st to 6th week)	Qualitative analysis

CHAPTER 4

RESULTS

The purpose of this mixed-methods study was to examine the effect of role assignment on students' social presence in online discussions. Three different assigned roles, starter, moderator, and summarizer, were used in the experimental group. Before starting the discussions, online discussion activities were introduced to both the experimental group and the control group; the roles and responsibilities of the roles were introduced to the experimental group, and general discussion guidelines were shared with the control group participants but they were not assigned to any roles. During the study, participants participated in online group discussions on three different cases about technology integration in education. Social presence indicators were examined in discussion posts using content analyses. At the end of the study, a social presence scale was conducted to measure and compare the experimental and the control group participants' social presence scores. In this chapter, the results of the analysis to examine the effect of role assignment on participants' social presence in online discussions were shared. Data analysis of each research question was reported in a detailed way with both descriptive and inferential statistics.

4.1 The use of social presence indicators in terms of assigned roles

4.1.1 Research question 1a: What percentage of social presence indicators are used in asynchronous online discussion posts of the experimental and the control group?

Online discussion posts from three different discussion activities were used to understand how social presence is reflected across different assigned roles in asynchronous online discussions. Data from discussion posts were transferred into Microsoft Word and then transferred into MAXQDA 2020. The discussion posts were coded based on the categories and indicators of social presence formed by Rourke, Anderson, Garrison, and Archer (2001). In addition to these indicators, "expressing disagreement" was added under the category of Interactive Responses as used in Lowenthal and Dunlap's (2020) study. The indicator of referring explicitly to other messages was taken off since participants did not use direct references to the contents of others' posts. Table 8 shows the frequency of each category and indicator of social presence in the experimental group and the control group.

As shown in Table 8 and Figure 5, the participants' posts in the experimental group the most frequently contained cohesive responses in 2247 responses, followed by interactive responses in 1648 responses, and affective responses in 1050 responses. On the other side, the participants' posts in the control group most frequently included interactive responses with 1393, followed by cohesive responses with 1034, and affective responses with 364.

Table 8. Frequency of Categories and Indicators of Social Presence

Category & Indicator	Experimental	Control	Total
Total affective responses	1050	364	1414
Expression of emotion	881	237	1118
Use of humor	9	0	9
Self-disclosure	160	127	287
Total interactive responses	1648	1393	3041
Continuing a thread	500	527	1027
Quoting from other messages	19	16	35
Asking questions	331	66	397
Complimenting, expressing appreciation	386	166	552
Expressing agreement	394	581	975
Expressing disagreement	18	37	55
Total cohesive responses	2247	1034	3281
Vocatives	759	192	951
Addresses or refers to the group using inclusive pronouns	952	826	1778
Phatics/Salutations	536	16	552
Total	4945	2791	7736

Table 9. Frequency and Percentage of Categories of Social Presence

	Affective	Interactive	Cohesive
Frequency (Experimental)	1050	1648	2247
Percentage (Experimental)	74.3%	54.2%	68.5%
Frequency (Control)	364	1393	1034
Percentage (Control)	25.7%	45.8%	31.5%

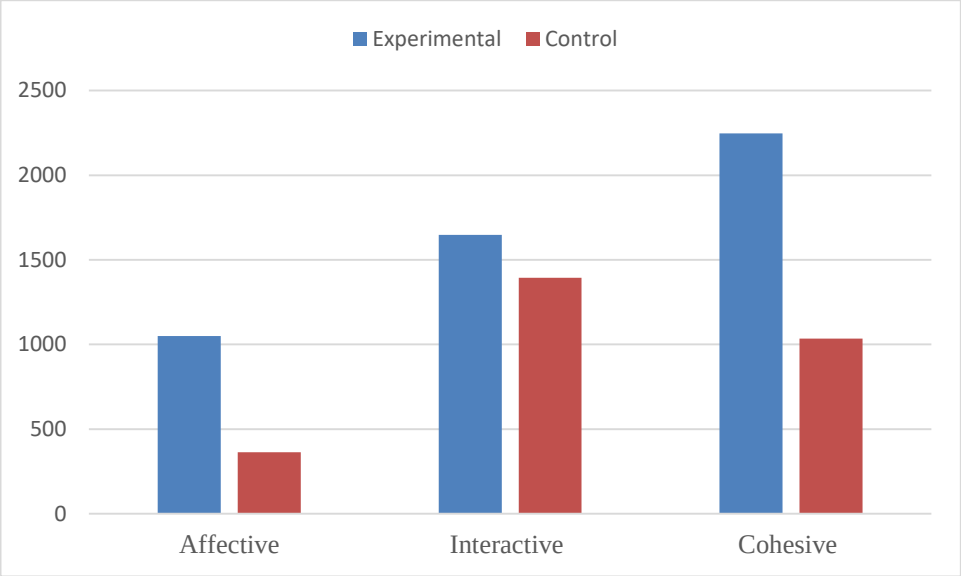

Figure 5. Frequency of social presence categories in the experimental group and the control group

The comparison of the participants' posts in terms of each category of social presence revealed that the experimental group used approximately three times more affective expressions and two times more cohesive expressions than the control group. Considering the participants' total responses for each category as a percentage, 74.3% of the affective responses, 54.2% of the interactive responses, and 68.5% of the cohesive responses were created by participants who were in the experimental group. Therefore, as shown in Figure 5 visually, the discussion posts of the experimental group showed higher frequency in each category of social presence.

4.1.2 Research question 1b: Is there a significant difference in social presence scores of the experiment and the control group?

Social Presence Scale (Kim, 2011, Appendix D) was used in order to measure and compare the experimental and the control group participants' social presence scores after the implementation of case discussion activities toward the end of the semester.

Data from the Social Presence Scale were entered into Microsoft Excel and transferred into SPSS. Shapiro Wilk's test for normality was conducted to check if the data were normally distributed. Based on the results of Shapiro Wilk's test, the social presence scores of the control group (N=41) were normally distributed ($p > .05$). However, the social presence scores of the experimental group (N=40) did not appear to be normally distributed ($p < .05$). After the data set of the experimental group was checked, two of the participants' scores were significantly different from the other data points in the data set. As shown in Figure 6, it looks like they randomly answered the scale questions. Therefore, these two outliers were removed from the data set.

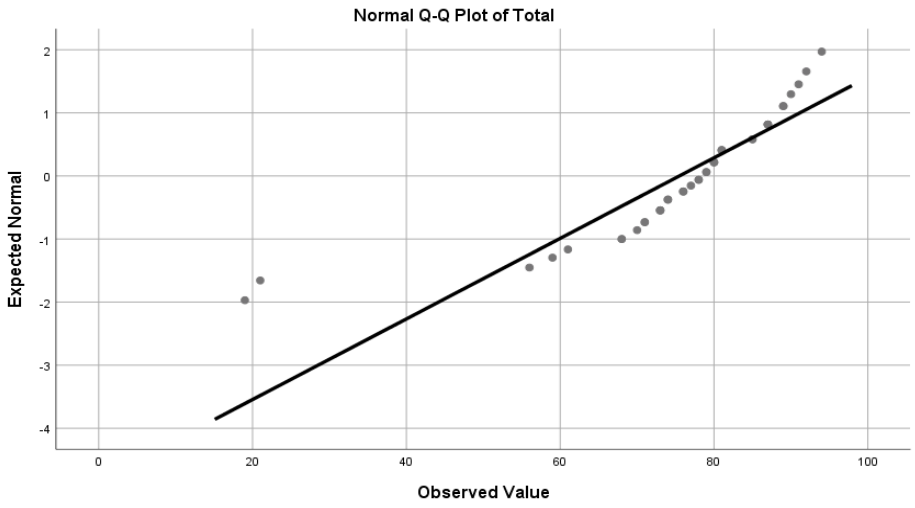

Figure 6. Normal Q-Q plot of the students' scores in the experimental group before removing the outliers

Based on the results of Shapiro Wilk's test, the social presence scores of the experimental group (N=38) were normally distributed ($p > .05$) (see Table 10). Social presence scores of participants in the experimental group with skewness of -.485 (SE = .383) and kurtosis of .016 (SE = .750), and social presence scores of participants in

the control group with skewness of -.010 (SE = .369) and kurtosis of -.273 (SE = .724) were presented in Table 11.

Table 10. Shapiro-Wilk Result of the Experimental Group and the Control Group

	Shapiro Wilk		
	Statistic	df	Sig.
Experimental	.968	38	.334
Control	.977	41	.552

Table 11. Descriptive Statistics of the Experimental and the Control Groups

	N	Skewness	Kurtosis	Min	Max	Mean	Median	SD
Experimental	38	-.485	.016	56	94	78.42	79.00	9.11
Control	41	-.010	-.273	49	89	72.09	71.00	9.56

Accordingly, the Independent Samples T-test was carried to examine if there was a significant difference in social presence scores of the experimental and the control group. The mean score of the experimental group is 78.42, and the mean score of the control group is 72.09. Also, the minimum score in the experimental group is 56 and the maximum score was 94; while the minimum and maximum scores in the control group are 49 and 89 (see Table 10).

The results of the Independent Samples T-Test indicated that there is a statistically significant difference between the social presence scores of the experimental group and the control group (t (77) = 3.002, $p < .05$), as presented in Table 12. The results of the scale data showed that there was a statistically significant difference between the social presence scores of the experimental group and the control group.

Table 12. Independent Samples T-Test for Social Presence Scores of the Experimental Group and the Control Group

		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference
Total	Equal variances assumed	.092	.762	-3.002	77	.004	-6.323492
	Equal variances not assumed			-3.008	76.937	.004	-6.323492

The quantitative analysis of the research question 1a (What percentage of social presence indicators are used in asynchronous online discussion posts of the experimental and the control group?) showed that the experimental group's online discussion posts included more social presence categories than the control group's posts in each social presence category. The experimental group's posts included approximately three times more affective expressions and two times more cohesive expressions than the control group. Also, the quantitative analysis of research question 1b (Is there a significant difference in social presence scores of the experiment and the control group?) revealed that the social presence scores of the experimental group and the control group were significantly different. The social presence mean score of the experimental group was higher than the control group's mean score. This result indicated that the students who had roles showed a higher social presence in online discussion posts. Also, after checking the scale items, the items that the control group participants agreed least were the 7th (I was able to be personally close to other participants in the class.), 12th (Even though we were not physically together in a traditional classroom, I still felt I was part of a group.) and 14th (I felt the other participants tried to form a sense of community.) items. That

means, the experimental group members felt like a part of a group more, had a higher sense of community and closeness to the others more than the control group members. Based on the results, the findings of the analysis of discussion posts supported the scale results.

4.2 The reflection of participants' social presence in terms of assigned roles

4.2.1 Research question 2.a/b/c: What CoI indicators are present in discussion posts of participants who were assigned to the starter/moderator/summarizer role?

4.2.1.1 Social presence indicators in starters' posts

Starters' responsibilities were initiating the discussion and encourage others in the discussion using a positive tone. The starters used cohesive expressions the most, especially they used phatics/salutations in their post. It was expected considering their responsibility that is starting the discussion of each week. Here are some quotes from the starters' posts include the indicator of phatics/salutations:

> Hello everyone, I hope you are all healthy and doing well in the global pandemic. Another week, another discussion; I hope you are not bored yet because this discussion won't be the last one :). (Participant35)
>
> Hii everyone, I hope you enjoyed reading our last case as much as I did! (Participant12)

The second category the starters most used was interactive expressions. As it can be seen from Table 4.5, their posts mainly included the indicator of asking questions that were also expected in terms of their responsibilities. They were

responsible to initiate the discussions by directing questions to the group members about the case. Here is another example from a starter's post from the second case:

> …Now, there are a few things I would like to ask you. What could be the reasons for the failure of AYP standards in the school where the teacher works? What kind of problems can be encountered when using technological devices such as smart boards in the classroom environment? And finally, we see that Miss Villarreal's students' motivation increase. What do you think the connection between the source of this motivation and the electronic whiteboard? Does this motivation return to its normal state after the children take their enthusiasm? (Participant1)

Considering the category of affective expressions, starters used the indicator of expression of emotion the most in their posts. They generally ended their posts saying how they were excited to read the others' posts about the related cases. Here are some quotes from the starters' posts:

> …I am very excited to read your precious suggestions and ideas about such a difficult situation! Thank you all in advance. (Participant18)

> …Apart from that, I wonder what different technologies we can use in the classroom to increase students' motivation. As an inexperienced teacher, I would love to hear ideas from those who have been able to apply some technology-based teaching methods. :) (Participant9)

> …When I read the text, I was confused whether the increase in motivation was due to innovation or the Hawthorne effect, but I made up my mind :) I want to talk about that later during the discussion. I think some of us might be confused like me; hence, I am curious about your thoughts on this topic and the continuity of motivation. Have a nice weekend! (Participant33)

Even if the indicator of self-disclosure was used fewer than the other indicators, starters were the most used participants of this indicator; they presented more details of their lives outside of class or expressed vulnerability.

> …I'll give my answer to your second question from my own experience. When smart whiteboards first came in, I was excited, just like the students at ELM High School, and I was motivated. But over time, I got used to this technique, and my motivation didn't always stay the same, i mean high... (Participant41)
>
> …We also had U-shaped lab classes in middle school and high school. However, our teacher was successful at classroom management so we didn't have such games problems etc. The U-shape actually worked!... (Participant20)
>
> …I also want to talk about my experiences. During this situation, I gave lessons both online and face to face. In both cases, the main problem that occurred was that students loose attention to the lesson. To cope with that I try to involve students in the lesson by sharing interesting information about the topic and ask them to talk and share... (Participant2)
>
> …To be honest, I do not know if counselors also have such groups but maybe sharing the drudgery of adjusting the foreign material is a brilliant solution…(Participant29)
>
> …I can't think of any other suggestions on this… (Participant32)

4.2.1.2 Social presence indicators in moderators' posts

Moderators were responsible for ensuring the continuity of the discussion and encourage others for sharing ideas maintaining a positive tone. Moderators used

interactive expressions the most. They mainly used the indicators of asking questions and complimenting, and expressing appreciation, aligning with their role of encouraging the others in their group to share their thoughts. In the quote below, it can be seen the two parts of a moderator's post. In the first part of the quotation, the moderator expressed appreciation, then the moderator asked questions to the other group members:

> Thank you, Participant15 for sharing your thoughts. :) … What other techniques do you think can motivate students to be more active and enthusiastic? Are the effects of these techniques being technological or traditional on students different? For instance, distributing various roles to us in this forum motivates me and makes me more active. What do you think about it?... (Participant7)

Here are two more posts that include the same indicators:

> …So far we have talked about how technology motivates the students in classrooms, thank you for your contributions. As we have been spending too much time with technological devices due to pandemic, do you think these devices have developed any features that cause a lack of motivation too? (Participant5)

> …Thank you for these good questions, Participant25, you have touched on really good points… Why do you think some teachers successfully integrate technology into their teaching while others fail?... (Participant41)

Cohesive expression was the second most used category by the moderators. They mainly used all of the indicators under cohesive responses. Below is a quote from the first part of a moderator's post in which the moderator started with

greetings, then addressed the two of the group members by their names, and lastly addressed the group using “our”:

> Hi again. I have noticed that we haven't heard from Participant2 and Participant7, I hope you two are well. I would like to hear your ideas so that we can widen the perspective of our discussion… (Participant5)

Vocatives was the most used indicator by the moderators. In the following quote, a moderator addressed the several group members in different parts of the post:

> Hello, Participant25, I'm very good… Participant25, it was a point shot to combine this discussion with the UDL principles that we committed this week… Thank you for these good questions, Participant25, you have touched on really good points. I can't wait to hear Participant24's and Participant34's ideas, do not deprive us from your opinions, we need them:) (Participant41)

Moderators used affective expressions fewer than the other categories, like the other participants who were assigned to the other roles. However, their posts included more affective expressions comparing with the starters’ and the summarizers’ posts. Moderators used the indicator of expression of emotion more frequently than the other indicators under this category. Some examples from the moderator’s post are as follows:

> …as a candidate for a physics teacher, experiments always exciting for me!... Maybe I am missing something please do not hesitate to share your thoughts. I am waiting to hear them! Also Participant11 and other group members I would like to hear your voice, too. (Participant16)

…I hope my point is more clear now :)… (Participant16)

…I myself hope to become like him. I think our friends should definitely check this video out as well! Can't wait for your comments! (Participant14)

…Also, it would be great to hear from all of you if you have had any experiences as a tutor… Anything you want to share with us is welcome. :) (Participant12)

…I, personally, am happy that I will be able to utilize your knowledge throughout the semester… (Participant5)

4.2.1.3 Social presence indicators in summarizers' posts

Summarizers were responsible for summarizing key ideas and make a conclusion about the discussions using a positive tone. Since summarizers were responsible to create a summary post when it is necessary and at the end of each week, their posts most frequently included cohesive expressions which were expected. Summarizers used the indicator of vocatives more frequently than the other indicators under the category of cohesive expressions. They addressed the group members by their names while summarizing the key ideas of the others. There are several quotes from the summarizers' posts:

…Our starter Participant20 asked to what kind of challenges and problems do we expect. Participant18 has shared some problems about computer labs in middle school … Participant20 has shared her experiences about computer lab in middle school and in her middle school she did not face such problems. Then Participant18 has shared her opinion about avoiding distraction and she suggested that the easiest way is to ban any type of distraction. Participant21

has shared her opinion about U-shaped method is effective method for teacher to manage classroom… (Participant8)

…We can clearly see why Participant31 and Participant43 thinks so… Participant43 and Participant42, one of my friends, gave examples from their experiences with electronic blackboards in their classes … Participant31 mentioned that the computer is synonymous with games for children… As Participant43 said, the support of parents as well as teacher support is very important…(Participant44)

…First of all, Participant34 started with a nice summary summarizing our last week and made a suggestion about giving workshops and trainings to teachers as a solution proposal. Participant30 and Participant41 also joined Participant34, and Participant41 also made another point … (Participant24)

…Participant14 and Participant3 preferred self-learning, on the other hand, Participant12, Participant16, and I preferred learning with assistance… Lastly, Participant16 brought up an important concern, which is reluctant students, and Participant14 suggested giving a questionnaire and learn their interest… (Participant11)

Interactive expression was the second most used category by the summarizers. Their main role was summarizing the group members' ideas and making conclusions. Therefore, they more frequently expressed agreements and disagreements to connect and relate to the ideas. Also, they generally complimented other group members for sharing their thoughts at the end of the discussion. Besides, they use the indicator of asking questions fewer than the others since they were

responsible to conclude the discussion. Below are some quotes that the summarizers expressed the agreements and disagreements:

> …And we all agree that some barriers are caused by teachers, on the other hand some of them are caused by non-technology savvy students. The last agreement was government must provide schools which do not have enough technical devices. There is also a disagreement about the priority of the internal motivation and lack of gadgets in Turkey...(Participant18)
>
> …Participant3 suggested that competition between the students can be an effective solution. Some of us did not agree, but some agreed with Participant3 but indicated that age group is an important factor…(Participant12)
>
> …Participant4, who agreed with Participant2's proposal to establish a committee for teachers' orientation problems… Participant15 disagreed with the idea of being a classmate's assistant, arguing that bullying is common in this age range… (Participant7)

Summarizers' posts included affective expressions fewer than the other expressions. They mainly used the indicator of expression of emotion, like the starters and the moderators. There are some quotes from the summarizers' posts as examples of the use of the expression of emotions:

> …You are welcome; I am glad you like it :)… (Participant11)
>
> …I'm sure most of us say it's a shame when we look back :) … It was a little long summary, I hope you are not bored :) We enjoyed discussing this topic… (Participant38)
>
> …It looks like we've handled the issue from different angles and I think we've done a good job :) I hope we continue like this next week… (Participant32)

…it's an interesting coincidence to be honest :)… It is not fair to give the same grade to those who contributed and who didn't… I enjoyed this week's discussion for its real-world similarity in contemporary Turkish education system as well... (Participant22)

…This week I saw that we were focusing a little more on solution suggestions, and that made me happy…Frankly, I really enjoyed talking and brainstorming with you this week with your point of view and different solutions to the problems… (Participant24)

…Though it is not a lot, I still feel some pressure about keeping up with that digital era because it develops so fast :) (Participant11)

The analysis of the discussion posts indicated that the participants who had roles used more social presence indicators in their posts compared to the participants who did not have roles.

4.3 Integration of findings

The study aimed to explore the use of CoI indicators in terms of assigned roles. Therefore, the frequency analysis which was qualitative analysis conducted. Frequency of the use of social presence categories and indicators for each role was checked to investigate participants' social presence in terms of assigned roles. Table 13 shows the frequency of categories and indicators of social presence used in the participants' discussion posts in the experimental group.

Table 13. Frequency of Categories and Indicators of Social Presence in terms of Assigned Roles

Category & Indicator	Starter	Moderator	Summarizer
Total affective responses	120	127	81
Expression of emotion	92	101	75
Use of humor	3	2	2
Self-disclosure	25	24	14
Total interactive responses	210	373	222
Continuing a thread	68	122	75
Quoting from other messages	3	2	7
Asking questions	69	83	22
Complimenting, expressing appreciation	31	94	66
Expressing agreement	36	70	65
Expressing disagreement	3	2	9
Total cohesive responses	235	298	244
Vocatives	61	115	90
Addresses or refers to the group using inclusive pronouns	83	93	72
Phatics/Salutations	91	90	82
Total	565	798	547

The starters used cohesive expressions the most in 235 responses, followed by interactive expressions in 210 responses, and affective expressions in 120 responses. On the other side, the moderators used interactive expressions the most in 373 responses in their discussion post, followed by cohesive expressions in 298 responses, and affective expressions in 127 responses. Like the starters, the summarizers also used cohesive expressions the most in 244 responses, then

interactive expressions in 222 responses, and affective expressions in 81 responses in the discussion posts. The histogram graph of the frequency of the use of social presence categories can be seen in Figure 7. Table 14 shows that moderators used approximately two times more interactive responses than the starters and the summarizers did.

Table 14. Frequency and Percentage of Categories of Social Presence in terms of Assigned Roles

	Affective	Interactive	Cohesive
Frequency (Starter)	120	210	235
Percentage (Starter)	36.6%	26.1%	30.2%
Frequency (Moderator)	127	373	298
Percentage (Moderator)	38.7%	46.3%	38.4%
Frequency (Summarizer)	81	222	244
Percentage (Summarizer)	24.7%	27.6%	31.4%

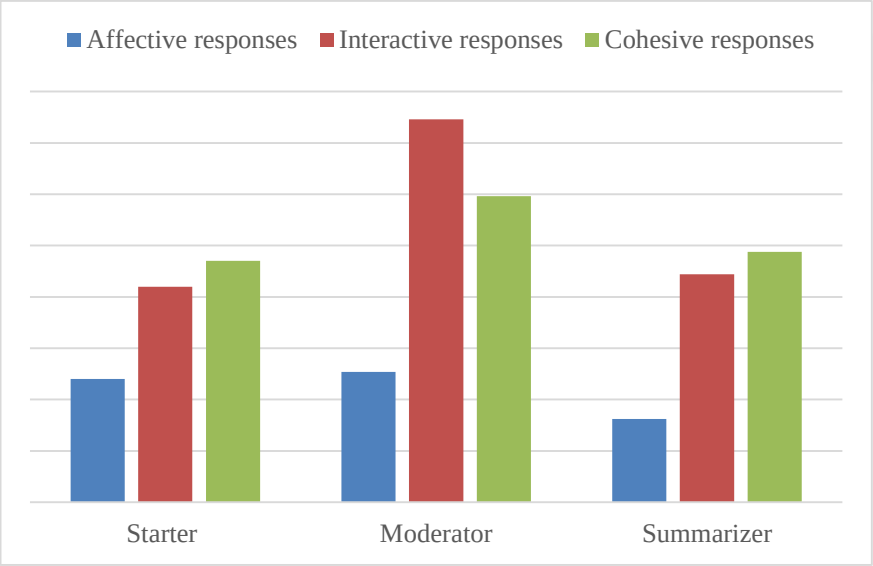

Figure 7. Frequency of categories of social presence in terms of assigned roles

These results indicated that the students who had roles showed a higher social presence in online discussion posts. Also, the moderators used more indicators of social presence in 798 responses, then the starters used in 565 responses, and the summarizers in 547 responses.

CHAPTER 5

DISCUSSION AND CONCLUSION

The current study examined the impact of role assignment strategy on students' social presence in asynchronous online discussions. Three different cases on technology integration in education were used for online discussion activities with preservice teachers throughout six weeks as a part of an educational technology course. The first research question explored the extent of the effects of using role assignment strategy on students' social presence in asynchronous online discussions. The results of the study showed that there was a statistically significant difference between the social presence scores of the control group and the experimental group. This result indicated that the assigned roles fostered participants' social presence in the online discussions. The second question of the study was about how social presence emerged across different assigned roles when students participate in asynchronous online discussions. The analysis of the participants' discussion posts showed that the participants' posts in the experimental group included more social presence indicators. The starters' and the summarizers' posts included cohesive indicators the most. On the other hand, the moderators' posts included the interactive indicators more frequently. Affective indicators were used the least by all of the roles.

In the following section, the results of the data are discussed by referring to the literature, and possible implications of the findings are presented. Finally, the limitations of the study and further research suggestions are provided.

5.1 Impacts of role assignment on participants' social presence

The first research question of the study focused on to what extent using role assignment strategy affects students' social presence in asynchronous online discussions. Independent Samples T-Test was performed to compare the social presence scale (Kim, 2011) scores of the experimental group and the control group. The results of the Independent Samples T-Test revealed that the social presence scores of the experimental group and the control group were significantly different; the mean of the experimental group was higher than the control group. The reason for the statistical difference in the scale results might be related to the more frequent use of social presence indicators by students who had roles. The analysis of the discussion posts supported the results of the scale data. That means the results of the quantitative analysis are supported by the results of the qualitative analysis.

The frequency of categories and indicators of social presence in the experimental group and the control group showed that the control group's posts included only three indicators more frequently than the experimental group. These indicators were continuing a thread, expressing agreement, and expressing disagreement. The results showed that the control group's posts included the indicator of expressing agreement the most compared to the other indicators. Rooderkerk and Pauwels (2016) proposed that creating controversial content is crucial to get replies from others in online discussions. However, as Joyce and Kraut (2006) stated, the probability of receiving replies is minimum using the indicator of expressing agreement. In this study, the control group members might not try to create complex content. Therefore, they used the simplest indicator that is expressing agreement. Even if this result does not consistent with the literature considering the higher use of the indicator of continuing a thread, the use of the indicator of

expressing disagreement was also higher which encourages others to reply to the post (Chen, Lo, & Hu, 2020). Chen, Lo, and Hu (2020) pointed out that expressing disagreement means sharing different opinions; therefore, the probability to get a reply is higher. Although the control group's posts included the indicator of continuing a thread more frequently, they engaged in a lower social presence in their posts. Also, even if the control group's posts included the three indicators under the category of interactive responses more frequently, the use of interactive responses was higher in the experimental group, as in the other categories.

In Swan and Shih's (2005) study, the findings indicated that the students' messages more frequently included affective responses, followed by interactive responses and cohesive responses. On the contrary to these findings, the discussion posts of the experimental group in the present study mostly included cohesive responses, and the control group's posts included interactive responses more frequently. The possible reason for these results is that starters and moderators were responsible to encourage others to share ideas in the discussions. Therefore, they often used vocatives and addressed the group using "we", "us", or "our" to invite others. Also, summarizers' summary posts mainly included the group members' names since they were responsible to summarize the ideas and thoughts of others. Moreover, the common responsibility of all of the roles was maintaining a positive tone. Therefore, nearly all of the experimental groups' posts started with phatics/salutations. On the other hand, the control group's posts mostly included the indicators of continuing a thread and expressing agreement that are under the category of interactive expressions. The possible explanation for this is that these two indicators are easier to implement in the discussions. Replying to others' messages is easier than sharing your own opinion. Therefore, the control group members might

prefer to reply to others' posts. Also, the control group members might not prefer to create controversial messages. Therefore, they used the simplest indicator that was expressing agreement.

In this study, the experimental group's posts included affective indicators three times more than the control group's posts. Cesareni et al. (2016) stated that the students who had roles shared their personal lives and experiences more frequently than the non-role takers, which aligns with the findings of this study. In parallel with the findings of other studies, participants in high social presence groups were more likely to share their experiences and feelings with other group members (Gunawardena & Zittle, 1997; Swan & Shih, 2005). As Gunawardena and Zittle (1997) stated, the participants who had higher social presence improved their socio-emotional experience by using emoticons to express their feeling in a nonverbal way. Also, several emotions were identified in the participants' discussion posts. For example, the experimental group participants much more stated their "enjoyment" saying that they "enjoyed reading about others' ideas, thoughts, and reading the cases." The emotion of "happiness" emerged in several participants' posts. One participant said "It made me very happy that we talked about many issues the previous week." and another participant stated that "I am really happy to see that we had a great discussion this week." The emotion of "wonder" emerged more than the other emotions in the discussion posts. Participants generally stated that they "wonder others' ideas and thoughts, what others think, and if others have any solution". Also, a few posts included "unhappiness" in the discussions. Participants generally expressed their unhappiness using emoticons. Also, the findings indicated that the participants' emotional presence was higher in the experimental group.

In addition, affective expressions were the least used indicator for both groups, as parallel with the results of Lowenthal and Dunlap's (2020) study. Akyol, Garrison, and Özden (2009) proposed that the emotional expressions used in the blended lessons were lower than the expressions used in the online lessons. As the researchers suggested, since students cannot physically be together, they need to know each other in online lessons; therefore, students may need to use more emotional expressions in the online discussions.

Among cohesive responses, addressing or referring to the group using inclusive pronouns were the most used indicator in both groups. However, the participants' posts in the experimental group included this indicator more frequently than the control group's posts. These results are consistent with previous studies (Lowenthal & Dunlap, 2020; Swan & Shih, 2005). The possible reason for this is that the participants who were assigned roles need to address the group using "we", "us", or "our" considering the responsibilities of their roles. Therefore, the experimental group's posts included this indicator more frequently than the control group's posts.

Among interactive responses, "continuing a thread" and "expressing agreement" were the most used indicators in the discussions. The findings showed that the control group's posts included these two indicators more frequently compared to the experimental group's posts. The members of the control group were more likely to continue the threads and build upon the responses of other group members. A possible explanation for this result might be that the use of these indicators requires less effort than the other indicators. Avci's (2019) study stated that the students who did not foster by scaffolds showed fewer contributions to the phases of cognitive presence. Therefore, in this present study, the participants who

did not have any roles might prefer to use the most basic indicators to create their posts.

After examining all the indicators, the top three indicators used by participants were “addresses or refers to the group using inclusive pronouns” which was used 1778 times, “expression of emotion” which was used 1118 times, and “continuing a thread” which was used 1027 times. In parallel with the results of Lowenthal and Dunlap’s (2020) study, “continuing a thread” was one of the most used indicators in the discussion posts. Also, cohesive and interactive expressions were used more frequently than affective expressions, as in this study.

The least frequently used indicators were “use of humor” in 9 times, “quoting from other messages” in 35 times, and “expressing disagreement” with 55 times. These results are consistent with the literature (Lowenthal & Dunlap, 2020). The posts of the control group did not include the use of humor. Participants generally used humor when they shared details about their personal lives. This shows their posts that included this indicator also contained the indicator of self-disclosure. While the experimental group quoted the parts of other participants’ posts more frequently, the control group expressed the disagreements more than the experimental group.

Many researchers have explored the impacts of role assignment strategy on students’ cognitive presence (Avci, 2019; Darabi et al., 2011; De Wever et al., 2010; Gašević et al., 2015; Olesova & Lim, 2017; Schellens et al., 2005; Wise et al., 2012). Avci (2019) investigated the impacts of role assignment scaffolds in collaborative knowledge-building and reported that the use of scaffolds fostered students’ knowledge-building process in online discussions. Darabi et al. (2011) also

investigated scaffolding strategy to foster cognitive presence in online discussions. The results indicated that the scaffolded group generated more segments for the resolution phase. De Wever et al. (2010) pointed out that role assignment strategy supports cognitive presence by fostering students' decision-making and knowledge-building process. Gašević et al. (2015) investigated role assignment strategy to support cognitive presence.in asynchronous online discussions. The results of the study supported that role assignment facilitates a high-level of cognitive presence. Olesova and Lim (2017) also pointed out that assigning roles supported students' learning processes and outcomes in online discussion environments. The results of the present study indicated that the role assignment strategy can also be an effective scaffolding strategy on social presence.

5.2 Impacts of role assignment on students' social presence in terms of assigned roles

The second research question of the study examined how social presence was reflected across the different assigned roles when participants participated in asynchronous online discussions. In order to answer this question, the level of participants' social presence was analyzed through content analysis of the discussion posts for both groups. The discussion posts were coded based on the categories and indicators of social presence developed by Rourke et al. (2001).

The results of the current study indicated that the moderators' posts included more indicators of social presence in 798 responses, followed by the starters in 565 responses, and the summarizers in 547 responses. The analysis of the discussion posts showed that starters' posts more frequently included cohesive indicators. Starters were responsible to initiate the discussion, therefore, their posts

mainly started with greetings. Also, starters generally addressed all members of the group to share their thoughts and feelings. Therefore, their posts' often included inclusive pronouns to refer to the group. The second most used category by the starters was interactive expressions. In this category, the most used indicator was asking questions. The more use of this indicator aligned with the expectations of starters' roles. Starters' other responsibility was encouraging others to participate in the discussions. Therefore, asking a question was a suitable strategy to provide participation. Starters included the other indicators under the interactive expressions in their posts less than the others who had different roles. Interactive expressions were used less than the other categories. Starters encouraged the other group members' participation mainly through sharing their feelings and emotions; starters showed a high-level of emotional presence. Also, starters' posts included the indicator of expression of emotion the most compared with all indicators from each category of social presence. The findings of this study indicated that the starter role can be effective to support students' social presence.

Moderators' posts included interactive expressions the most in their discussion posts. Moderators' main responsibility was ensuring the continuity of the discussions. Therefore, the main use of the indicator of continuing a thread aligned with the responsibilities of moderators' roles. Moderators' most used indicator to ensure the continuity of the discussions was responding to the others. They complimented the others' posts and showed their agreement to encourage others to continue to share their opinions. The results indicated that the moderators asked questions, complimented others, and expressed their agreements more than the other role takers. Moderators' second most-used category was cohesive expressions; they called the other group members by their names more than the other role takers.

Moderators responded to the other group members' posts more frequently, therefore, the more use of these indicators aligned with the expectations of their roles. Also, they addressed the group using inclusive pronouns more than the starters and the summarizers. Moderators' posts contained fewer affective expressions comparing to the other social presence categories. However, they shared their emotions more than the other role takers. Moderators' emotional presence was higher than the other role takers. The possible reason for this finding might be related to the responsibility of moderators which was encouraging others to share ideas; they encourage the other group members' participation by sharing their feelings in discussions. Moderators were responsible to care for every member's ideas and express appreciation. Therefore, their posts included the expression of emotion more frequently than the other role-takers.

Summarizers' posts more frequently included cohesive responses. The most used indicator out of all other indicators was vocatives. Summarizers were responsible for making a summary post at the end of the discussions. Therefore, they referred the group member by their names while summarizing the key points and connecting the members' posts with the discussion topic. Also, the summary posts included closures. Therefore, the use of phatics/salutations was the second most used indicator. Interactive expression was the second most used category by summarizers. They were responsible to make a conclusion. As a result, they asked questions less than the starters and the moderators. They quoted from other group members' posts to show how individual posts were related to the topic. Also, summarizers expressed disagreements more than the starters and the moderators to connect the members' posts with the discussions. Summarizers' posts included affective expressions less than the other role takers. Also, emotional presence in starters' posts was observed

less than the other role takers' posts; they share their feelings and their personal lives less frequently than the starters and the moderators did.

Cesareni et al. (2015) found that students with the summarizer role were more active in the discussions. The findings of the current study contradict such findings in terms of social presence; the summarizers were least active in the discussions, and even if their summary posts were longer than the starters and the moderators, the summary posts included fewer social presence indicators. The possible explanation of this result might be related to the responsibilities of this role; they were responsible for summarizing key ideas and making conclusions. Therefore, their posts included fewer emotions and self-disclosure, and they asked fewer questions than the other role takers. In parallel with the results of Avci's (2019) study, starters were the second and summarizers were the third in terms of participation; and moderators were most active in social categories.

The findings of this study showed that all three types of roles (starter, moderator, and summarizer) had an impact on the level of social presence when students participated in asynchronous online discussions. The participants who had specific roles expressed their feelings, gave information about their personal lives, asked questions, complimented the others' posts, addressed the others by their names, used inclusive pronouns, and greeted others more frequently than the non-role takers.

The current study directly examined the impact of role assignment strategy on pre-service teachers' social presence in an online discussion environment in higher education settings. Unlike Rand's study (2017) which was about the use of role assignment to increase social presence, the current study found a significant difference between the experiment and the control groups' social presence. The

findings of the study, which indicated assigning different roles to the students can be effective in fostering their social presence in online discussion environments, are consistent with the studies in the current literature that assert role assignment can be an effective instructional strategy in terms of students' engagement and collaboration (De Wever, Van Keer, Schellens, and Valcke, 2009; Gaševic, Adesope, Joksimović, & Kovanović., 2015; Ghadirian et al., 2019; Xie, Yu, & Bradshaw, 2014).

5.3 Recommendations and implications for future research

The present study has beneficial and practical implications to support social presence and may provide valuable information and guidance for instructional designers, educational technologists, and instructors. From a practical standpoint, the findings of the study suggest that instructional designers, educational technologists, and instructors should take advantage of the role assignment strategy while creating a discussion environment to support students' social presence in higher education.

The assigned roles in the current study had the same definitions and responsibilities as the majority of the studies in the literature. Yet this study differed from other studies considering the discussion cases and the analysis of social presence. The discussion cases were selected according to the instructional objectives of the course. Also, the majority of the previous studies focused on the impact of role assignment on cognitive presence, but, as far as is known, there is no study that directly examines the impacts of role assignment on students' social presence in online discussion environments. This mixed-method study contributed to the role assignment and the Community of Inquiry literature by providing data about the impact of role assignment on social presence in online discussions. Based on the scale results, the participants who had roles developed a higher sense of community

and had more effective communication. Therefore, the role assignment strategy can be effective to foster social presence. However, there should be more studies focusing on the effects of situational variables, such as group size, the role of the instructor, and the learning task, on social presence. Also, this study did not cover the learning outcomes. Therefore, future research should investigate the influences of social presence on learning outcomes.

The participants of the study were pre-service teachers who enrolled in a web-based course that was about technology integration. Therefore, the participants had enough technology knowledge to participate in the study. For future studies, there may be a need to prepare and share guide documents or videos for students who may not have enough technology knowledge since the lack of technology knowledge may affect their performance.

5.4 Limitations of the study

Assignment of the participants to the groups might be a limitation of this study. The course sections were randomly assigned to the experimental group or the control group. However, the participants were not randomly sampled to the groups. Therefore, there can be threats regarding the internal validity of the study.

Another limitation of the study might be related to the participants and the course. The participants of the study were only pre-service teachers and the data were collected from a single course. To generalize the findings of the study to a larger population, the study might be replicated by selecting participants from different departments with a larger number of courses and using relevant discussion cases aligning with the instructional objectives of those courses.

The last limitation of the study might be the selected cases for asynchronous online discussions. Three different cases about technology integration in education were selected for online discussion activities. Using cases on different topics may change the content of the discussions.

APPENDIX A

GUIDELINES FOR THE STARTER ROLE

Your responsibilities	Corresponding strategies	Example
Initiate the discussion	Start with directing questions to the group members about the topic	"The case says… I thought… This made me think: How would teachers' work experience affect students' motivation?..."
Maintain positive tone	Use a balanced sense of humor	"I know none of you work for money :) So what are the reasons that motivate you during your teaching experiences?..."
	Start with greetings to the post	"Hello dear peers, I want to know what are the reasons that motivate you during your teaching experiences?...."
Engage others in the discussion	Use inviting words such as "we, us, our"	"Besides the curriculum objectives, we have personal goals during our teaching experiences… For example, I want to… What kind of personal goals do you have?"
	Add new points to the discussion	"Fatma and Gözde mentioned that becoming a good role model is one of their goals….."

A Poor Example

The case this week covers student motivation. The motivation of the students is one of the important factors to engage learners in the lessons. Having a good lesson plan sometimes is not enough to create an effective learning environment. I look forward to discussing this topic.

A Good Example

Hi class! I hope you had a great weekend. This week we will discuss the strategies to increase the motivation of students. This case has made me think about my own techniques to increase my motivation and I want to talk about that later during the discussion. I think all of us think that motivation is a significant concept that we should talk about and share what we know, right :) I know that there are teachers among us, so maybe they want to go first. I want to hear about everyone's own experience with student motivation problems. Looking forward to learning more!

APPENDIX B

GUIDELINES FOR THE MODERATOR ROLE

Your responsibilities	Corresponding strategies	Example
Ensure the continuity of the discussion	Connecting the ideas in different posts	"Hi Gözde, as you mentioned, having a lesson plan is very important. You can review Fatma's posts. Others continue to discuss it under Fatma's post. Please share your ideas there..."
	Reactivate the discussion when it is necessary	"We began to talk about different lesson models before. Maybe we should continue to share our opinions on..."
Maintain positive tone	Express appreciations	"I think Fatma touched an important point, thank you….."
	Clarify the conflicts in different posts	"Maybe firstly we should understand why Gözde sees parental involvement as a problem…."
Encourage others for sharing ideas	Address the group members using their names	"Hi Fatma, we have not heard from you yet, do not deprive us of your opinions💻 Have you ever attended professional development training?..."
	Care for every member's ideas	"Each of us has different professional skills, if everyone shares their own experiences, we can better understand the efficiency of professional development training…."

A Poor Example

The case this week covers student motivation. The motivation of the students is one of the important factors to engage learners in the lessons. Having a good lesson plan sometimes is not enough to create an effective learning environment. I look forward to discussing this topic.

A Good Example

Hi class! I hope you had a great weekend. This week we will discuss the strategies to increase the motivation of students. This case has made me think about my own techniques to increase my motivation and I want to talk about that later during the discussion. I think all of us think that motivation is a significant concept that we should talk about and share what we know, right :) I know that there are teachers among us, so maybe they want to go first. I want to hear about everyone's own experience with student motivation problems. Looking forward to learning more!

APPENDIX C

GUIDELINES FOR THE SUMMARIZER ROLE

Your responsibilities	Corresponding strategies	Example
Summarize key ideas	Identify the opposite views	"...There are two different opinions; social media is a distracting or motivational tool …"
	Show how individual posts relate to the topic when needed	"Fatma shared some data about how students learn from Instagram as an indicator of Gözde's hypothesis of the usefulness of social media for educational purposes…"
Maintain positive tone	End the week with closures	"This week we had an intensive discussion, thank you all for sharing your experiences related to the university entrance exams…I really enjoyed reading about your experiences. Let's keep up the good discussion next week/for the following cases!"
Make conclusions	Connect the members' posts with the topic by giving the references of the related posts	"To sum up our discussion, Fatma mentioned the economic situation of the family, and Gözde added the city where the family as the variables of having private lessons. Thus, we can say that… Do you agree?"
	Offer solutions and consensus	"We agreed that increasing the quality of government schools can eliminate the disadvantages of economic status…How about..."

A Poor Example of Summarizer Post

Gözde mentioned the importance of peer feedback. Barış and Fatma supported her comment. Merve said that teacher feedback is more important and valuable for students. Others in the discussion seemed like they did not agree with her.

A Good Example of Summarizer Post

Hello class! This week we talked about the future of schools. Many of us thought that there will be no school buildings in the future. Melis and Bora said that students will participate in lessons online; and thanks to virtual reality and artificial intelligence, it will be easier to create more effective learning environments in the future. Several of us did not agree with this idea as they mentioned the importance of school buildings considering the socialization. Maybe the solution includes both of them. Ayhan and Fatma talked about the advantages of the two sides. Since participating in lessons online saves our time and money, school buildings can be used for socialization, like sports and art activities. Let's keep up the good discussion about this topic.

APPENDIX D

SOCIAL PRESENCE SCALE INSTRUMENT

Mutual attention and support

1. I respected the others' opinions in making decisions.
2. I felt the other participants respected my opinion in making decisions.
3. What the others did affected what I did.
4. I tried to concentrate on our discussion.
5. I paid close attention to the other participants.
6. Online group activities helped me learn efficiently.

Affective connectedness

7. I was able to be personally close to other participants in the class.
8. I enjoyed sharing personal stories with the other participants.
9. I got to learn a great deal about the other participants in the class.
10. I was influenced by the other participants' moods.
11. I called the other participants by their names.

Sense of community

12. Even though we were not physically together in a traditional classroom, I still felt I was part of a group.
13. I was able to form a sense of community.
14. I felt the other participants tried to form a sense of community.
15. I worked with the other participants to complete the task.

Open communication

16. I felt the other participants acknowledged my point of view.
17. My opinions were clear to the other participants.
18. I enjoyed engaging in exchange of ideas with the other participants.
19. I easily understood how the other participants reacted to my comments.

5 point Likert-type scale
1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree

APPENDIX E

ETHICS COMMITTEE APPROVAL

T.C.
BOĞAZİÇİ ÜNİVERSİTESİ
SOSYAL VE BEŞERİ BİLİMLER YÜKSEK LİSANS VE DOKTORA TEZLERİ ETİK İNCELEME KOMİSYONU
TOPLANTI TUTANAĞI

Toplantı Sayısı : 13
Toplantı Tarihi : 11.02.2021
Toplantı Saati : 12:30
Toplantı Yeri : Zoom Sanal Toplantı
Bulunanlar : Prof. Ebru Kaya, Prof. Dr. Fatma Nevra Seggie, Doç. Dr. Mehmet Yiğit Gürdal, Dr. Öğr. Üyesi Yasemin Sohtorik İlkmen
Bulunmayanlar :

Fatma Şeyh
Eğitim Bilimleri

Sayın Araştırmacı,

"The Impact of Role Assignment on Social Presence in Online Discussions: A Mixed-Method Study" başlıklı projeniz ile ilgili olarak yaptığınız SBB-EAK 2021/3 sayılı başvuru komisyonumuz tarafından 11 Şubat 2021 tarihli toplantıda incelenmiş ve uygun bulunmuştur.

Bu karar tüm üyelerin toplantıya çevrimiçi olarak katılımı ve oybirliği ile alınmıştır. COVID-19 önlemleri kapsamında kurul üyelerinden ıslak imza alınamadığı için bu onanı mektubu üye ve raportör olarak Yasemin Sohtorik İlkmen tarafından bütün üyeler adına e-imzalanmıştır.

Saygılarımızla, bilgilerinizi rica ederiz.

Dr. Öğr. Üyesi Yasemin
SOHTORİK İLKMEN
ÜYE

e-imzalıdır
Dr. Öğr. ÜyesiYasemin Sohtorik İlkmen
Öğretim Üyesi
Raportör

SOBETİK 13 11.02.2021

Bu belge 6070 sayılı Elektronik İmza Kanununun 6. Maddesi gereğince güvenli elektronik imza ile imzalanmıştır.

APPENDIX F

CONSENT FORM FOR THE EXPERIMENTAL GROUP

PARTICIPANT INFORMATION and CONSENT FORM

Research sponsoring institution: BOĞAZİÇİ UNIVERSITY

Title of the research project: The Impact of Role Assignment on Social Presence in Online Discussions: A Mixed-Method Study

Project Manager: Dr. Mutlu Şen-Akbulut | **E-mail address:** mutlu.sen@boun.edu.tr | **Phone:** 0212 359 6789

Researcher: Fatma Şeyh | **E-mail address:** fatma.seyh@boun.edu.tr | **Phone:** 0531 969 5890

Dear students,

Dr. Mutlu Şen-Akbulut who is an instructor in the Department of Computer Education and Educational Technology at Boğaziçi University is carrying out a scientific research project. The research aims to explore the impacts of role assignment strategy on students' social presence in online discussions.

As CET 360 Instructional Technologies and Material Development students at Boğaziçi University, you are continuing the lessons online due to the COVID-19 threat. This research aims to support your social presence with meaningful discussion activities using role assignment strategies; thus help us to increase your participation and engagement in the lessons.

During CET360 course, you will participate in three different discussion activities through the university's Learning Management System (LMS). Each discussion activity will continue for two weeks. The discussion topics will be selected as three different cases. There will be several roles that will be assigned to you in each case. These roles are the starter, moderator, and summarizer. The discussions will proceed in groups of 6 people. In the first week of each case, the first three students will have a specific role (e.g. starter, moderator, or summarizer) and the other three will be participants; in the second week of each case, the other three students will have a specific role in each group. Thus, every student will have a role in each discussion activity. During all discussions, the members of your groups will be the same and your roles will change.

To participate in the research, you should complete the scale that is sent to you by e-mail. If you volunteer for this research, your online discussion posts in three discussion activities during 6 weeks in the semester will constitute data.Your identities will not be shared at any part of the research. Your involvement in the study is voluntary, and you may choose not to participate or to stop participating at any time without penalty. The decision to be in the study or not to be in the study and researcher's evaluation of your work will not affect your grades. However, your participation in the research will make a contribution to support and create effective online discussions. The stored records will be destroyed after the completion of the research. There are no known risks or inconveniences associated with this study.

Please ask if you have any questions about the study before signing this form. If you have any questions later, you can ask the project coordinator (Phone: 0 212 359 67 89). You can consult the Boğaziçi University **Ethics Committee for Master and PhD Theses in Social Sciences and Humanities** (SOBETIK) about your rights regarding research (sbe-ethics@boun.edu.tr).

I have read the text above and understood the scope and purpose of the research I was asked to participate in. I realized that I could quit this study whenever I wanted, without having to give any reason, and that I would not encounter any negativity if I quit.

Participant Name-Surname:…….. **I approve to participate in the study.**	**Researcher Name-Surname: Fatma Şeyh**

APPENDIX G

CONSENT FORM FOR THE CONTROL GROUP

PARTICIPANT INFORMATION and CONSENT FORM

Research sponsoring institution: BOĞAZİÇİ UNIVERSITY

Title of the research project: The Impact of Role Assignment on Social Presence in Online Discussions: A Mixed-Method Study

Project Manager: Dr. Mutlu Şen-Akbulut | **E-mail address:** mutlu.sen@boun.edu.tr | **Phone:** 0212 359 6789

Researcher: Fatma Şeyh | **E-mail address:** fatma.seyh@boun.edu.tr | **Phone:** 0531 969 5890

Dear students,

Dr. Mutlu Şen-Akbulut who is an instructor in the Department of Computer Education and Educational Technology at Boğaziçi University is carrying out a scientific research project. The research aims to explore students' social presence in online discussions.

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To participate in the research, you should complete the scale that is sent to you by e-mail. If you volunteer for this research, your online discussion posts in three discussion activities during 6 weeks in the semester will constitute data.Your identities will not be shared at any part of the research. Your involvement in the study is voluntary, and you may choose not to participate or to stop participating at any time without penalty. The decision to be in the study or not to be in the study and researcher's evaluation of your work will not affect your grades. However, your participation in the research will make a contribution to support and create effective online discussions. The stored records will be destroyed after the completion of the research. There are no known risks or inconveniences associated with this study.

Please ask if you have any questions about the study before signing this form. If you have any questions later, you can ask the project coordinator (Phone: 0 212 359 67 89). You can consult the Boğaziçi University **Ethics Committee for Master and PhD Theses in Social Sciences and Humanities** (SOBETIK) about your rights regarding research (sbe-ethics@boun.edu.tr).

I have read the text above and understood the scope and purpose of the research I was asked to participate in. I realized that I could quit this study whenever I wanted, without having to give any reason, and that I would not encounter any negativity if I quit.

Participant Name-Surname:…….. **I approve to participate in the study.** ☐	**Researcher Name-Surname: Fatma Şeyh**

APPENDIX H

CODING SHEET USED FOR CONTENT ANALYSIS

Category	Indicators	Definition of Indicators	Examples
Affective Responses	Expression of emotions	Conventional expressions of emotion, or unconventional expressions of emotion, includes repetitious punctuation, conspicuous capitalization, emoticons	This surprised me a bit this information makes us very happy I would like to hear ☺ sorry about that ☹ it is really HARD I am confused… I am glad you liked it ☺ this situation worries me a lot please share with us :)))
	Use of humor	Teasing, cajoling, irony, understatements, sarcasm	Stay positive test negative! Be careful, we can try to break them too What a school!
	Self-disclosure	Presents details of life outside of class, or expresses vulnerability	I have no idea how we can find a solution I experienced the same situation with you To give an example from myself…
Interactive Responses	Continuing a thread	Using the reply feature of the software, rather than starting a new thread	As you said You wrote that As you pointed out
	Quoting from other messages	Using software features to quote others entire message or	You said, "Students' interest and motivation increased since they discovered by themselves"

		cutting and pasting sections of others' messages	When you say, "I do not think the students' motivation will be fade soon."
	Asking questions	Students ask questions of other students or the moderator	What would you think? Does my questions are clear? What can be done? What other solutions come to your mind? How does that sound? What are your plans? Do you think that's possible, my friends? How about your experiences everyone?
	Complimenting, expressing appreciation	Complimenting others or contents of others' messages	You touched a very nice topic You asked very good questions Thanks for this great contribution This is a great idea I liked your example very much
	Expressing agreement	Expressing agreement with others or content of others' messages	We are at the same point of view I agree with you You are absolutely right We are on the same boat We have the same concerns
	Expressing disagreement	Expressing disagreement with others or content of others' messages	I disagree with that portion of your comment I partly disagree with you I can't say I fully agree with you
Cohesive Responses	Vocatives	Addressing or referring to participants by name	Yes Sally Michael started the discussion She also answered Judie's question

Addresses or refers to the group using inclusive pronouns	Addresses the group as we, us, our	We read the case When we become a teacher; We will move on our discussion I know some of us experienced that
Phatics/Salutations	Communication that serves a purely social function; greetings, closures	Morning everyone! Hi everyone, welcome to the last part of our discussion Salute to all my group mates and our instructor Greetings to everyone Hi my dear group friends! I hope everyone is having a great weekend and gets high grades from midterms See you soon! Have a nice weekend!

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