

# EXPLORING UNIVERSITY STUDENTS' LEARNING EXPERIENCES IN THE COVID-19 SEMESTER THROUGH THE COMMUNITY OF INQUIRY FRAMEWORK

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## ABSTRACT

This mixed-method study was conducted to validate the factor structure of the Community of Inquiry (CoI) framework in the COVID-19 semester (Spring 2020). Spring 2020 is typically characterized as an emergency remote teaching (ERT) period, distinguished from purposefully-designed instruction for online teaching. To examine the CoI framework's usefulness for understanding university students' online learning experiences in this period, the authors collected data using the CoI survey and interviews. The structural equation modeling analyses indicated that teaching presence predicted social and cognitive presences more significantly in the ERT period than regular times. The qualitative findings showed that the courses where teaching presence was high were evaluated as effective by participants even when cognitive and social presences in these courses were relatively low. These findings suggested that course instructors should prioritize planning well-designed online course activities to ensure their teaching presence in times of emergency.

**Keywords:** The community of inquiry framework, mixed-methods design, online learning, COVID-19 semester, structural equation modeling.

## INTRODUCTION

With the COVID-19 outbreak, all educational institutions worldwide were forced to shift from face-to-face education to fully online education. Although some educational institutions had already experienced blended or flipped learning, most schools or universities were unprepared for this abrupt transition because implementing fully-online education on a global scale had not been the case before (Zimmerman, 2020). Hodges et al. (2020) named teaching during the COVID-19 pandemic as *Emergency Remote Teaching* (ERT) as it started without proper planning. The term ERT is used to refer to the temporary shift from regular modes of teaching to online teaching, which is “quick to set up and is reliably available during an emergency or crisis” (Hodges et al., 2020, para. 13).

A recent study conducted with 897 faculty and administrators at 672 US institutions in the early weeks of the pandemic indicated that many colleges switched to new teaching techniques and/or delivery modes during the ERT period following the COVID-19 outbreak (Johnson et al., 2020). They also reported that they had to revise and adapt their course assignments, assessment tools, and course schedules regardless of whether they had had online teaching experience before. Moreover, most faculty were uncomfortable with virtual classrooms as they were not trained to offer their classes online or had little experience in teaching online (Baker, 2020; Govindarajan & Srivastava, 2020). Similarly, most students were anxious in the COVID-19 semester as online classes were a completely different way of receiving education for them (Bates, 2020).

The Community of Inquiry (CoI) framework (Garrison et al., 2000) has been used extensively to describe, explain, and improve learners’ inquiry processes in online education. The CoI framework models inquiry interactions through three elements: social, cognitive, and teaching presences in online learning. Social presence (SP) represents individuals’ interactions with other individuals in the online learning community using their reflective thinking. Cognitive presence (CP) involves constructing conceptual knowledge through collaborative inquiry and learning activities carried out by individuals in line with the determined goals in distance learning environments. Teaching presence (TP) addresses how teaching processes can be designed, facilitated, and guided by taking into account learners’ SP and CP.

Several studies explored the relationship between the CoI components. Maddrell et al. (2017) reported a positive and high correlation among TP, CP, and SP in their research study conducted with 51 graduate students in five distance education courses at a public university in the US. Garrison et al. (2010) found out that how students perceived TP was a strong predictor of CP and significantly shaped students’ perception of SP. TP significantly predicted both CP ( $\beta = .52$ ) and SP ( $\beta = .51$ ) (Garrison et al., 2010). Rockinson-Szapkiw et al. (2016) asserted that TP ( $\beta = .51$ ) was the strongest predictor of student achievement in an online course compared to SP ( $\beta = .32$ ) and CP ( $\beta = .19$ ). Horzum’s (2015) study showed that both TP ( $\beta = .20$ ) and CP ( $\beta = .28$ ) were significant predictors of the participants’ perceived learning. Similarly, Choo et al. (2020) found that TP ( $\beta = .28$ ) and CP ( $\beta = .32$ ) mainly determined online course evaluations, but not SP ( $\beta = .07$ ) in their study conducted with 223 undergraduate students at a public university in the US during three semesters.

## PURPOSE OF THE STUDY

As previous studies show, TP is the most determining element of students’ online learning experiences in regular online education. Yet, no research examined students’ learning experiences during the ERT period (COVID-19 semester) through the lens of the CoI framework. The purpose of this study is to validate the factor structure of the Community of Inquiry (CoI) framework in the COVID-19 semester (Spring 2020) using both quantitative and qualitative data. The research questions that guided this study are as follows:

1. To what extent do the student data collected during the ERT period fit into the CoI framework?
2. To what extent does TP predict CP and SP during the ERT period?
3. What CoI indicators are present in online courses during the ERT period?

## MATERIALS AND METHODS

This study was designed as an explanatory sequential mixed-method study (Creswell & Plano Clark, 2018). First, quantitative data were collected using the CoI survey (Arbaugh et al., 2008) and analyzed. Later, qualitative data were obtained with semi-structured interviews and analyzed to explain quantitative results.

### Participants and Context

Participants were selected from a public English-medium university in Turkey. The CoI survey (Arbaugh et al., 2008) was sent via e-mail to undergraduate students in the faculties of education, arts and sciences, economics and administrative sciences, and the school of applied sciences. 745 students responded to the survey; 29% freshmen, 26% sophomore, 24% junior, and 21% senior. 49% of the students that responded to the survey were from the faculty of arts and sciences; 22% of the students were from the faculty of education; 20% of them were from economics and administrative sciences, and 9% of the students were from the school of applied sciences. Participants' age ranged from 18 to 22. In structural equation modeling analyses, a large sample size is recommended (Browne & Sugawara, 1996; Ullman, 2001). In the current study, the ratio of sample size and the number of questionnaire items was 21.91; thus, the sample size was acceptable. We purposefully selected 18 participants among 31 volunteers for interviews through maximal variation sampling (Creswell, 2012) to represent different university programs in the dataset (see Table 1).

**Table 1.** Details about the Interview Participants

| Participant ID | Gender | Grade Level | Department                           |
|----------------|--------|-------------|--------------------------------------|
| 1              | Male   | Sophomore   | Mathematics                          |
| 2              | Female | Senior      | Primary Mathematics Education        |
| 3              | Female | Freshman    | Management and Information Systems   |
| 4              | Male   | Senior      | Foreign Language Education           |
| 5              | Female | Sophomore   | Translation and Interpreting Studies |
| 6              | Male   | Freshman    | Turkish Literature and Language      |
| 7              | Female | Junior      | Chemistry                            |
| 8              | Male   | Sophomore   | Psychology                           |
| 9              | Male   | Senior      | Management and Information Systems   |
| 10             | Female | Freshman    | Molecular Biology and Genetics       |
| 11             | Male   | Junior      | Economics                            |
| 12             | Male   | Sophomore   | Linguistics                          |
| 13             | Female | Senior      | Secondary Mathematics Education      |
| 14             | Female | Sophomore   | Primary Mathematics Education        |
| 15             | Female | Sophomore   | Economics and Management             |
| 16             | Female | Senior      | Psychology                           |
| 17             | Male   | Senior      | International Trade                  |
| 18             | Female | Senior      | Sociology                            |

### Data Collection Procedures

The CoI survey (Arbaugh et al., 2008), which contains a 5-point Likert scale for in total 34 TP, SP, and CP items, was administered in English via a web-based form. Participants were asked to fill out the survey by considering their most effective online course(s) in the COVID-19 Spring semester. They also filled out a web-based form to volunteer for interviews after completing the CoI survey. Semi-structured interviews with open-ended questions were conducted with volunteers to explore what TP, CP, and SP indicators (Garrison et al., 2000) emerged in the online courses participants took. The interview protocol included

seven main questions, along with several sub-questions focusing on students' learning and interactions with their peers and instructors, such as, "How would you evaluate your communication and interaction with your classmates/instructor?" and "How would you evaluate your learning experiences?"

## **Data Analysis**

### **Quantitative Data Analysis**

The original CoI survey was developed by Arbaugh et al. (2008) to measure three dimensions: TP, CP, and SP. They used exploratory factor analysis to develop the survey. Arbaugh et al. (2008) reported that the instrument's internal consistency was 0.94 for TP, 0.91 for SP, and 0.95 for CP. In the present study, the reliability of the collected data was analyzed based on Cronbach's alpha coefficient. A Cronbach's alpha value between 0.70 and 0.80 is considered "acceptable," between 0.80 and 0.90 is considered "good," and above 0.90 is considered "excellent" (George & Mallery, 2003). SPSS version 25.0 was used to estimate the alpha coefficient.

A confirmatory factor analysis was used to evaluate whether the proposed structure fits into the participants' responses. The three-dimensional structure was tested using weighted least squares means and variance adjusted (WLSMV) estimation method as the survey items provided ordinal data. The model fit was evaluated using root mean square error of approximation (RMSEA), comparative fit index (CFI), and Tucker–Lewis index (TLI). An RMSEA value of less than 0.08 and CFI and TLI values higher than 0.95 are considered a good fit for the data (Browne & Cudeck, 1993; Hu & Bentler, 1998; Kline, 2010). Mplus 7.2 (Muthen & Muthen, 2013) was used to conduct a confirmatory factor analysis.

By extending the measurement model tested by confirmatory factor analysis, the extent TP predicted SP and CP was examined in a structural equation model. TP was hypothesized to predict both CP and SP simultaneously. Standardized regression coefficients were reported and evaluated. Mplus 7.2 (Muthen & Muthen, 2013) was used to conduct the structural equation modeling analysis. Additionally, by randomly splitting the data in half and estimating the model fit and regression coefficients twice, the cross-validity of the results was tested. In the dataset, there were no missing values. Acknowledging that any significant relationship in a structural equation model does not mean a causality between independent and dependent variables, we also analyzed the qualitative data collected through semi-structured interviews.

### **Qualitative Data Analysis**

Before the data analysis, the first and second authors reviewed the CoI framework together. The authors employed Boyatzis' (1998) hybrid approach to thematic analysis for the qualitative data. The first author created a coding scheme that included codes drawn from the literature of online education and the CoI framework. Afterwards, they analyzed three interviews together and created emerging codes generated from the data. In the second cycle of coding, each author coded seven interviews individually. Finally, they discussed analyses to reach a consensus on developing a codebook. After the authors completed individual coding based on the codebook, they compared the codes from four interviews through data parsing (Watkins, 2017). There were 140 codes from the four interviews. Out of 140, 14 codes were changed or revised, and 11 codes were deleted. Following this ultimate consensus, the codes that included similar topics were collected under categories. Trustworthiness was ensured using several techniques that are for enhancing credibility (Lincoln & Guba, 1985). Researcher triangulation was provided by having two researchers who coded the data independently and discussed the resulting codes to reach a consensus. Additionally, an experienced qualitative researcher not involved in data coding was involved in peer-debriefing by reviewing the emerging themes and providing feedback.

## FINDINGS

### Quantitative Findings

#### The Reliability of the Survey Data

The data's reliability was evaluated based on Cronbach's alpha coefficient, calculated as 0.98 for TP, 0.94 for SP, and 0.97 for CP dimensions. These values indicated excellent internal consistency of the data (George & Mallery, 2003).

#### The Confirmatory Factor Analysis

The factor structure of the CoI survey was evaluated by conducting confirmatory factor analysis. As the original instrument proposed a three-dimensional structure, the extent to which participant responses supported the three-dimensional structure was tested (see Figure 1). The confirmatory factor analysis results reported in Table 2 showed that the data fitted the three-dimensional structure very well (RMSEA  $\leq$  .08., TLI  $\geq$  .95, CFI  $\geq$  .95). The standardized factor loadings of questionnaire items ranged from .86 to .96 for TP; .80 to .96 for SP; and .82 to .93 for CP. All of these correlations between items and factors were significant ( $p < .01$ ).



Figure 1. The measurement model of the CoI instrument

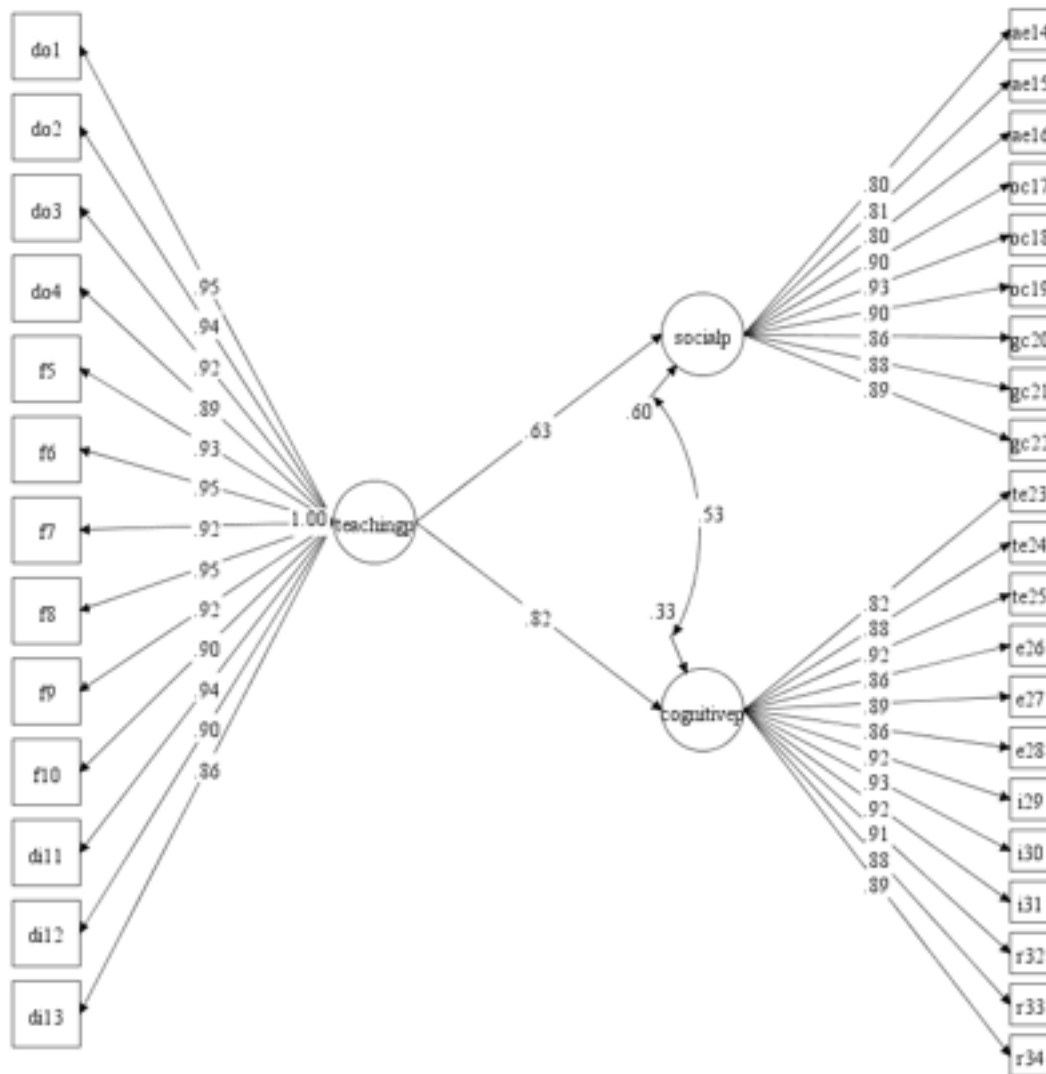
Table 2. Confirmatory Factor Analysis Results

| $\chi^2$ | df  | $\chi^2/df$ | TLI  | CFI  | RMSEA<br>(90% CI)   |
|----------|-----|-------------|------|------|---------------------|
| 2897.01  | 524 | 5.53        | .974 | .976 | .078<br>(.075-.081) |

Note:  $\chi^2$  = Chi-square, df = degrees of freedom, TLI = Tucker Lewis index, CFI = comparative fit index, RMSEA = root mean square error of approximation; CI = confidence interval.

### Predicting SP and CP by TP

TP was hypothesized to predict both SP and CP based on the literature. The present study results also showed that TP could significantly predict both SP ( $p < .01$ ) and CP ( $p < .01$ ). This means that when there was a high level of TP, SP and CP were also high, and when there was a low level of TP, SP and CP were low. As shown in Figure 2, the relationship between TP and CP ( $\beta = .82$ ) was stronger than the relationship between TP and SP ( $\beta = .63$ ). Overall, TP scores explained 40% of the variance in SP scores and 67% of the variance in CP scores.



**Figure 2.** Predicting SP and CP by TP

### Cross-Validating Measurement Model and Structural Equation Modeling Results

The data were split randomly. The model fit indices and the regression coefficients were estimated, and the results were compared. The confirmatory factor analysis results showed that the hypothesized three-dimensional model had a good fit for both random samples of data.

The structural equation modeling results showed that TP could significantly predict both SP ( $p < .01$ ) and CP ( $p < .01$ ) by random samples. Similar to the original data, the relationship between TP and CP (Sample1  $\beta = .83$ ; Sample2  $\beta = .81$ ) was stronger compared to the relationship between TP and SP (Sample1  $\beta = .65$ ; Sample2  $\beta = .61$ ). Overall, TP scores explained 42% (sample1) and 37% (sample2) of the variance in SP scores, and 68% (sample1) and 66% (sample2) of the variance in CP scores (see Table 3).

**Table 3.** Cross-Validation of Confirmatory Factor Analysis Results

|         | $\chi^2$ | df  | $\chi^2/df$ | TLI  | CFI  | RMSEA<br>(90% CI)   |
|---------|----------|-----|-------------|------|------|---------------------|
| Sample1 | 1634.64  | 524 | 3.12        | .979 | .981 | .075<br>(.071;.079) |
| Sample2 | 1608.35  | 524 | 3.07        | .974 | .975 | .075<br>(.071;.079) |

Note:  $\chi^2$  = Chi-square, df = degrees of freedom, TLI = Tucker Lewis index, CFI = comparative fit index, RMSEA = root mean square error of approximation; CI = confidence interval.

## Qualitative Findings

Interviews were analyzed to identify the three main elements of the CoI framework and obtain a deeper understanding of how these were related to each other in online classes in the COVID-19 semester.

### TP Indicators

Our findings pointed out several important factors affected participants' perception of high TP in their courses. In terms of TP elements, interview participants highlighted the importance of effective course design and organization, facilitating discourse, and assessment and evaluation.

Regarding effective design and organization, all interview participants emphasized the importance of having live class sessions and accessing course materials promptly. Participants found several instructional strategies effective in terms of the design and organization of the courses during the ERT period. For instance, synchronous discussions, small group activities, and writing and sharing reflections were effective instructional strategies listed by the participants. As most of the interview participants indicated, having access to course materials (e.g., lecture videos, presentations, or readings) before live sessions helped them to better prepare for class activities. Additionally, participants reported that they engaged in the courses where they studied the materials beforehand more and were more active during live class sessions. A few participants added that they could not attend live classes because of technical problems. Yet, they could still catch up with the courses when the instructors shared session recordings or course materials right after live sessions. Our interview data indicated that TP was also high in the courses where the instructors facilitated discourse by asking guiding questions, encouraging students' queries and participation, and keeping discussions focused on the topic. In addition, some of the interview participants stated that they found courses more effective when the course instructors provided prompt communication and obtained students' input about course activities (e.g., revising the syllabus).

In terms of assessment and evaluation, participants mentioned that they found authentic assessment opportunities more effective. Additionally, they emphasized that weekly quizzes or practice tests helped them maintain their course engagement and learn the content more easily. Participants also pointed out that the traditional evaluation methods (e.g., invigilated exams) usually resulted in unfair assessment in online settings. They suggested that open-book exams, group projects, and take-home written exams could be alternative assessment methods in online education. Table 4 presents the TP indicators that emerged from the data with the sample excerpts.



### **CP Indicators**

Our findings indicated that participants' CP was high in the courses where the instructor used authentic assessment tools, such as hands-on projects and/or provided authentic content by making it relatable to students' daily life. Participants became cognitively present when the instructor asked questions and held whole-class discussions over the authentic content. Additionally, participants reported that when they read their classmates' messages in the chat during live sessions or comments in online discussion forums, they were challenged to think about the topic being discussed from different perspectives. As most of the interviewees indicated, having access to everyone's comments in an online learning environment enhanced their learning. The present study findings clearly demonstrated that there is an interplay between authentic content, authentic assessment, and comments/ideas visible to everyone and CP in online learning settings during the ERT period (see Table 5).

### **SP Indicators**

In terms of SP, participants highlighted the importance of open communication with instructors, community building with other students, and peer interaction. As for open communication, all participants emphasized that they were more socially present and actively participated in classes when the instructor designed the course in collaboration with students. In addition, when community building was encouraged through course activities, participants felt more engaged in lessons and shared their opinions and ideas easily. The findings also showed that the more peer interaction was incorporated into class activities, the more socially present participants became. This resulted in their active participation and high engagement in online classes. It can be inferred that whether instructors kept communication and interaction with and among students constant determined how SP emerged in online courses during the ERT period (see Table 6).



**Table 4. Teaching Presence Categories and Indicators**

| Col Element       | Categories                        | Indicators                                    | Sample Excerpts   |
|-------------------|-----------------------------------|---|---|
| Teaching presence | Effective design and organization | Providing extended access to course materials | Participant 12: The instructor uploaded lesson videos. We watched those and took quizzes. Afterward, the instructor allocated one live class session to discuss any questions about the topic or the quiz, or anything we shared.   |
|                   |                                   | Planning and sharing course materials timely  | Participant 10: In Calculus 101, the instructor gave assignments. I preferred not to participate in the live class sessions but study at home on my own time. While studying at home, I reviewed the presentations as the instructor shared them with us. Usually, we used presentations for the live class sessions. When there was no presentation, the instructor showed us the problems he prepared and solved via his tablet. So it was an effective course for me. As we completed quizzes and assignments regularly, I was engaged in the class. I felt as if we had had face-to-face classes.   |
|                   | Facilitating discourse            | Designing engaging live class sessions        | Participant 13: Before weekly live class sessions, we had online discussions on Moodle. And, everybody in the class shared their ideas during live classes. We got feedback on the videos and lesson plans we prepared from the course instructor. After getting feedback, we wrote our reflection essays about what went well, what did not go that well, and what could have been done better.  |
|                   |                                   | Encouraging participation                     | Participant 2: Our instructors encouraged us to participate in classes very much. We did several group activities and were asked to share our ideas with our classmates as we did in our face-to-face classes. For instance, we created dialogues together in online language classes. In addition, we prepared presentations individually and had discussions about those presentations as a whole class. Similarly, all of our instructors made great efforts to encourage us to participate in classes actively.   |
|                   |                                   | Encouraging to ask questions                  | Participant 13: The instructor always asked questions, such as 'How does this idea sound?' 'What do you think about this?' to us. He probably noticed an issue that needs to be revised and wanted to see whether we were aware of the same issue by questioning. In both courses the instructor offered, he usually emphasized aspects of the topic to attract our attention. When he asked, 'What do you think about this?'; I started to think about some different parts of the videos and then provided answers to his question. The instructor usually gave us positive feedback and provided us with several other ways through which the activities could have been completed. This approach of the instructor supported my learning a lot. |
|                   | Assessment and evaluation         | Planning quizzes                              | Participant 15: Especially quizzes given every week and assignments given about the experiments we completed both kept us active in the class and allowed us to better understand the weekly topic. Rather than exams such as cumulative finals, I think these small tasks and assignments enhanced our learning quality in online classes as it was a little bit harder to self-discipline to study for exams at home.   |
|                   |                                   | Authentic assessment                          | Participant 4: If we had taken a midterm and a final exam in this course like in regular semesters, I would have studied just for exams and then forgotten everything I studied. Yet, as we created products in this course during the Covid-19 semester, I was engaged in meaningful learning. In my opinion, when we avoid exam anxiety and are given the opportunity of presenting our knowledge through 1-2-week-long projects rather than 2-hour exams, that learning experience becomes more favorable for us.  |
|                   |                                   | Fair evaluation                               | Participant 17: I think online assessment could be handled by asking questions to prevent students from cheating. As in the course example I gave, it was doable. The course instructor I mentioned gave us a project and asked us to make interpretations within the project. Like an open-book exam, we made our interpretations and expressed what we thought for the project's questions. This was more appropriate for the online education period because I believe there was no place for traditional assessment methods in online education.  |

**Table 5.** Cognitive Presence Categories and Indicators

| Col Element        | Categories  | Indicators  | Sample Excerpts   |
|--------------------|---|---|---|
| Cognitive presence | <p>Triggering event: Meaningful learning activities</p> <p>Exploration: Sharing opinions</p> <p>Integration &amp; resolution: Implementation of ideas</p> | <p>Authentic content</p> <p>Visible comments to everyone</p> <p>Authentic product</p> | <p>Participant 17: We participated in an online computer-based experiment. It was about behavioral economics. It was a helpful experience for us. More specifically, we experimented with how you could manage your budget and how much you would spend on what. The experiment was supervised by one of the doctoral students of the course instructor. We were pleased to participate in this experiment. It was good as it was online. And I learned a lot from the investigation.</p> <p>Participant 7: It was good to see others' comments or responses in the chat when the instructor asked a question or somebody answered the question you asked. This happened in my cinematography course. When the instructor asked something, my classmates shared their ideas about the question via chat. In this way, I guess I learned course topics well. In regular face-to-face classes, I did not know what was going on in others' minds while watching a movie, or people did not share their opinion out loud. But, in online classes, we could write our comments via chat while watching movies. Reading those comments, I started thinking like, "This makes sense, too," "Humm, this person thinks in the same way I do," or "Why does this person think in this way?" So, having messages or comments appearing in the chat while watching movies was effective for my learning.</p> <p>Participant 16: I was engaged in the [psychology] class because we started doing hands-on activities. I think such activities keep students more engaged in the course rather than quizzes or tests. Putting my knowledge into practice was a good learning experience for me. I both learned new things and experienced conducting personality measurements, which I had not done before. In this way, I felt engaged in the class.</p> |

**Table 6.** Social Presence Categories and Indicators

| Col Element     | Categories                     | Indicators                                | Sample Excerpts  |
|-----------------|--------------------------------|---|--|
| Social presence | Student voice in course design | Getting students' input for course design | Participant 5: My instructors always received our input and feedback about course design. Especially in the literature course I mentioned before, the instructor sent us a poll about how we would like to have the classes before the Covid-19 distance education period started. Afterward, we all together decided that we would have both synchronous and asynchronous courses. It was very good and important that the instructor made our voice heard and designed the online course accordingly. As a result, all of my classmates were very pleased about how that course was adapted to online education. The thing I like most during this online education period was that our instructor cared about our opinions and got our input while making decisions about courses.  |
|                 | Ownership of learning space    | Community building among students         | Participant 13: In my opinion, peer interaction in our class was very effective. We continuously gave feedback to each other on the works we completed. First, we started commenting on each other's posts on Moodle. Then, we replied to those comments and revised our posts accordingly. All of these happened before the class on Moodle. Then, we discussed each of these comments more deeply during live class sessions. In this sense, our interaction level was high. I think Moodle facilitated this high-level interaction because we could see each other's posts and comment on them. And then, we talked about those during online class time. This naturally increased my interaction with my classmates.   |
|                 | Class cohesion                 | Peer interaction                          | Participant 2: There was no student from my department in my language course, Italian. I knew only one person who was not from my department. There were several students from different departments in the class. If we had had this course in a face-to-face environment, I would probably not have gotten to know so many people in the class because everybody would sit in the same seats and make groups with the same people. I would form a group with students I somehow knew in a physical classroom. Yet, in our zoom classes (live class sessions), the instructor always created groups randomly. I learned everybody's name in the class, and got to know them. This was an interesting experience for me.   |
|                 | Self-expression                | Active participation and high engagement  | Participant 8: I think instructors of all the courses I took successfully managed student participation. First of all, we had the virtual hand option in Zoom. Sometimes, raising your hand in a face-to-face class is not that easy. As you do a physical action to raise your hand in a face-to-face class, in my opinion, it requires more courage. Yet, while using a virtual hand, you just click and turn off your camera if you would like. My instructors continuously encouraged me to turn on my camera and ask questions. In this way, I think more questions were asked during lessons. When so many questions were asked, you could see that not all questions were advanced level. There were intermediate-level questions asked by other students in the class. Because of this, it was easier for me to pose questions during online courses. In face-to-face courses, usually, students who have enough courage and think about course topics deeply ask questions. Yet, in online classes, many students were asking their questions. As a result, you can also ask any questions in your mind, which you would not ask in regular face-to-face classes, easily in online classes. |

## How TP Relates to CP and SP during the ERT Period

Our qualitative data analysis exemplifies how the relation between TP, CP, and SP unfolded in online classes during the COVID-19 semester. Qualitative data analysis yielded 229 codes for TP, 111 codes for SP, and 59 codes for CP. In the interviews, when participants were asked which course was the most effective one during the COVID-19 semester, they mainly discussed what the instructor did during the classes and how he/she designed live class sessions and online assessments, which are TP indicators.

To illustrate how the CoI elements interacted with each other during the ERT period, we reported the qualitative findings based on the following relations: TP and CP, TP and SP, and SP and CP. To explore the relation between TP and CP, we examined all the indicators and found that some aligned with each other. When the instructors integrated authentic content into their live class sessions by creating meaningful learning activities and facilitated discussions, the sessions became more engaging for students, and more CP was observed. For instance, Participant 10 highlighted that as the instructor made connections with students' lives through authentic materials, the course became very engaging for her.

*In the course that was most efficient for me, the last topic we discussed was "Women as Other-Feminism." We were assigned to read a few related articles, and the instructor brought the songs and poems that belong to that period to the class. As it was a social studies course, the instructor asked several questions, such as "What do you think about this?" "Do you think this is adaptable to our current world?" "If it was adapted to our current lives, how would you integrate it into your own lives?" and "How do you perceive this?" for instance, we also discussed a movie that we watched as a whole class, and the instructor asked several related questions to us. In this way, I think the course instructor aimed to engage us in the course content.*

The last category of TP is assessment and evaluation. One of the indicators of this category is authentic evaluation, and this aligns with authentic products in the category of CP (see Table 5). To clarify, when students create an authentic artifact that they may use in their real lives, high CP can be observed. For example, when questions about learning activities were asked during the interview, Participant 4 explained how he had developed authentic products for his final projects, such as a game to teach the topic of gerund and infinitives and lesson plans for English language teaching, instead of midterms or finals.

*I designed a computer-based game to teach English to Turkish students in one of my courses. Keeping the question "How could I teach gerunds and infinitives effectively?" in mind, I designed a game for one month using a software program. In my departmental course, I prepared a lesson plan to teach an English grammar topic. I selected the topic and the theme for this lesson plan. I developed the lesson plan completely based on the course textbook and the course instructor's template.*

Our findings also show that TP and SP were related in that instructors' design of group works and whole-class or small-group discussions facilitated community building among students particularly when switched to online learning rapidly. Participant 18 gave an example of how the instructor assigned a group work to prepare students for online classes right after the COVID-19 outbreak:

*The instructor grouped us in my language course and assigned us to prepare presentations right after the COVID-19 outbreak. She asked us to contact our groupmates and set up WhatsApp groups to keep class communication active and support each other in the transition period. Usually, I don't like group work, but this one worked well for me because we could prepare for classes together.*

When it comes to the relation between SP and CP, it can be argued that peer interaction and peer feedback interacted with students' CP. Participant 2 explained how she had used her classmates' feedback to revise her work in her teaching practicum course elaborately:

*My most positive experience during the COVID-19 semester was when we were assigned to record videos to teach lessons individually in my educational sciences courses. After uploading the videos to Moodle, we had synchronous class discussions and commented on each other's videos. In my opinion, we learned a lot during these discussions because we noticed what had been missing in the videos*

*and thought about how we could improve ourselves. I felt better when I received feedback from my peers because only the course instructor would observe the lessons I teach in our regular face-to-face classes. Yet, I shared my video with everyone in the class, and they could watch it individually in the COVID-19 semester. I received lots of feedback. Having the opportunity to get feedback from my peers and comment on their videos was useful.*

These qualitative findings supported the claim that TP was the main CoI element that facilitated SP and CP even during the ERT period. SP and CP also interacted with each other in the courses where peer interaction and peer feedback were encouraged.

## DISCUSSION

Previous studies that analyzed the relationships among the CoI framework elements found that more CP and SP were observed with higher TP, and TP strongly predicted both SP and CP in online classes (Akyol & Garrison, 2008; Caskurlu et al., 2020; Garrison et al., 2010; Horzum, 2015; Rockinson-Szapkiw et al., 2016). Parallel with these research findings, the current study's quantitative results also confirm that TP is a significant predictor of SP and CP. Compared to the previous research conducted in regular online learning environments, however, the present study shows that TP became even a stronger factor that shapes students' online learning experiences in terms of CP and SP during the ERT period. In the current study, TP significantly predicted both CP ( $\beta = .82$ ) and SP ( $\beta = .63$ ). TP scores explained 40% of the variance in SP scores and 67% of the CP scores variance. In Garrison et al. (2010)'s study, which was conducted in a regular online learning setting, TP was less strong in terms of predicting CP ( $\beta = .52$ ) and SP ( $\beta = .51$ ).

The qualitative findings of the current study also align with the result that TP was a strong predictor of CP and SP during the COVID-19 semester. When instructors encouraged student participation, facilitated discussion, and incorporated authentic content into their courses, which are TP indicators, students actively became involved in the learning process, becoming more cognitively present, as put forward by researchers (Fiock, 2020; Johnson, 2014; Sorensen & Baylen, 2009). Moreover, when students were encouraged to participate in whole-class discussions and share their ideas, they were likely to view discussion topics from different perspectives, which involves CP (Arbaugh, 2012; Garrison et al., 2010). Similarly, enacting TP by encouraging student participation in discussions also interacted with students' SP. Due to the instructor's scaffolding student participation through questions, students were involved in peer interaction and became engaged in the course, which are SP indicators (Lowenthal, 2010; Tu & McIsaac, 2002). Another example of the relation between TP and SP is that instructors' design of group works or discussions enhanced the sense of community among students, particularly after the rapid transition to online education in the COVID-19 semester (Rovai, 2000; Stephens & Roberts, 2017). Peer interaction is the basis of the relation between SP and CP. When peer interaction was promoted during live class sessions or peer feedback was received and given on an online discussion forum asynchronously, students gained different perspectives. They also made a cognitive effort to revise their work based on peer feedback (Fiock, 2020).

The qualitative findings also revealed that whether instructors adapted their courses to online modality, reconsidered assessment tools for online teaching, remained accessible during and after live class sessions, and obtained students' feedback about course activities relate to the extent of students' perceptions of CP and SP in those classes. While all these can be considered under TP, they are all specific to the instructor and determine the instructor social presence. Being at the intersection of TP and SP, instructor social presence is regarded as an aspect of TP (Borup et al., 2012; Swan & Shih, 2005). Therefore, while quantitative results pointed at TP as the strongest predictor for CP and SP, qualitative analyses highlighted that a subset of TP, instructor social presence, appeared to be one of the strongest elements that determined the perceived quality of online/remote courses during the COVID-19 semester.



## CONCLUSION

The findings of the present study suggest that course instructors should prioritize planning activities to ensure TP when designing online courses in times of emergency or under similar conditions. In recent years, schools have been closed due to several natural disasters, such as earthquakes, hurricanes, or fires (Barbour et al., 2020). While there is hope that the COVID-19 threat soon is diminished, the emergencies that require an immediate shift to online education will remain present. Therefore, it becomes important to identify factors that will increase the quality of online education in times of emergencies.

The findings should be interpreted within limitations. First, the study was conducted with a sample of undergraduate students at a public university from various faculties. However, probability sampling was not implemented, and the sample included participants from a single university, although the sample size was large. Therefore, the generalizability of the findings is limited. Second, the data sources of this mixed-method study were the CoI survey and qualitative semi-structured interviews. Even though the CoI survey and the interviews provided the relevant data on students' perceptions of the CoI elements in different online courses, we could not observe any online classes during the ERT period or collect any course materials, syllabi, and students' exams or projects.

## Suggestions for Further Research and Practice

Providing guidelines, this study may help instructors and instructional designers to understand students' expectations in similar conditions and design interactive, engaging, and meaningful learning environments in the future. Our findings shed some light on how TP, SP, and CP can be enhanced in online courses. We found that keeping connection and communication with their instructors and peers was important for students during the ERT period, while most distance education is designed for asynchronous modalities. Designing synchronous lessons and tasks to support interaction between students and instructors plays a crucial role in keeping students engaged in the learning process. It is also important to note that effective use of learning management systems (LMSs) to provide course materials and activities seemed essential to establish high TP. In addition, using LMSs effectively to hold whole-class asynchronous discussions or to let students provide peer feedback could enhance both CP and SP during the ERT period.

Given that it has been almost two years since the COVID-19 outbreak, what kind of teaching practices have been adapted by faculty members and how they have integrated the CoI indicators into their lessons could be investigated. Within the scope of the present study, most faculty members' use of technological tools was limited as a rapid transition to online teaching occurred in the COVID-19 semester. With the growing number of technological tools to facilitate students' collaboration and interaction, there are many other effective uses of technology to support TP, CP, and SP in online or blended courses. Thus, further research can explore TP, CP, and SP in settings where fully-online or blended courses are offered in the current post-ERT period, focusing on the role of effective technology use for synchronous and asynchronous tasks.

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