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Examining the Relationships among Self-Efficacy, Social Presence and Learning Beliefs

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Abstract: The aim of this study is to analyze the relationships among online self-efficacy beliefs, social presence in online environments, epistemological beliefs and teaching-learning conceptions of university students taking campus-based courses via distance learning. In line with this aim, by considering the related literature, a structural equation model was proposed which, then, was analyzed and discussed in light of the literature. A cross-sectional survey design guided the study. A total of 1,630 university students from a state university participated in the study during the spring term of the 2017-2018 academic year. An online self-efficacy scale, a social presence scale for e-learning environments, an epistemological beliefs scale and a teaching-learning conceptions scale were used as data collection tools in the study. The fit indices obtained in the analyses were observed at acceptable levels. The research findings revealed that the university students' online self-efficacy beliefs had an effect on their social presence perceptions, epistemological beliefs and conceptions of teaching and learning. Similar to the previous studies, the observed relationships were significant. Supporting students' levels of social presence to increase students' academic achievement was recommended considering the results.

Keywords: Online self-efficacy, social presence, epistemological beliefs, teaching-learning conceptions, structural equation model.

Highlights

What is already known about this topic:

- there are a number of factors affecting students' success and efficiency in e-learning environments.
- revealing relationships among students' online self-efficacy, social presence, epistemological beliefs, and teaching-learning conceptions is important for a better distance learning environment.

What this paper contributes:

- university students' online self-efficacy beliefs had a positive effect on their epistemological beliefs.
- university students' online self-efficacy beliefs were observed to significantly predict their teaching-learning conceptions.

Implications for theory, practice and/or policy:

- increasing students' levels of social presence also contributes to their academic success.
- preparing different online learning environments aimed at increasing students' levels of self-efficacy can enable the consolidation of positive experiences in this area.
- it is considered that the addition of various cultural variables to studies in this field can contribute to the formation of a more holistic point of view.

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Introduction

As in the rest of the world, the variety of distance learning programs and the number of people utilizing these programs is constantly increasing in Turkey. Campus-based common compulsory courses are conducted via distance learning at universities. That is in the higher education system of Turkey, certain must courses (Principles of Atatürk and History of Turkish Revolution, Foreign Language, and Turkish Language) were taken by students from all departments via distance learning. These courses are called campus-based distance learning courses. In this context, a number of studies examining the success and effectiveness of online learning have been conducted (Alqurashi, 2019; Cidral et al., 2018; Joo et al., 2013; Martin et al., 2010; Panigrahi et al., 2018; Tu, 2002; Tu & Corry, 2002; Tu & McIsaac, 2002; Wu et al., 2010;). Stating that information sources had changed hands and that individuals' dependence on external sources for accessing information had decreased, Bozkurt (2015) pointed out that the learning-teaching act has exited the monopoly of traditional education systems and that, through the opportunities offered by information and communication technologies, learning has become a process that continues throughout life. One result of this is that by using e-learning environments, it has become possible for students to access whatever information they need wherever and whenever they wish, and to communicate with whomever they wish. Another characteristic of e-learning environments is that they enable various communication technologies located on independent platforms to be presented together (Onal & Ibili, 2017). Considering all these features, it can be understood that there are a number of factors affecting students' success and efficiency in e-learning environments.

Just as psychological and sociological factors affect individuals' daily lives, so do they affect their learning experiences. Diversifying the internet-based communication tools used in e-learning environments also has a direct effect on social interaction between students. Self-efficacy, social presence, epistemological beliefs, and learning-teaching beliefs, which can be discussed among these psychological and sociological factors that are believed to affect the learning experiences of individuals utilizing online learning environments, form the research topic of this study.

With this aim, in order to enable university students' adaptation to online learning environments and if necessary, to provide the support that they might need in this respect, it is important for the psychological and sociological variables to be included in scientific research studies. In this sense, revealing the relationships among undergraduate and graduate students' online self-efficacy, social presence, epistemological beliefs, and teaching-learning conceptions is important in terms of offering students a better distance learning environment and supporting students' success. In this sense, this study was conducted to respond to the research question that *what are the relationships among university students' online self-efficacy beliefs, social presence in online environments, epistemological beliefs, and teaching-learning conceptions?* Previous research presented evidence that the variables of this study were related to each other, and these variables were effective on university students' online learning behaviors. Details related to the variables would be presented in the following section.

Literature

Theoretical Framework

The following sections was prepared to represent scientific literature about the belief system, self-efficacy, social presence, epistemological beliefs, and conceptions of teaching and learning which represented the variables of the study.

Belief System: Rokeach (1968) stated that humans possess millions of beliefs, that this situation can cause confusion and that therefore, when beliefs have an effect on behavior, they need to be placed within a hierarchy. In this context, beliefs are expressed as parts of a system in which they are in

constant interaction with each other, from those that are central towards those that are peripheral (Rokeach, 1968).

According to Rokeach's (1968) belief system, individuals possess five types of beliefs. Type A and Type B beliefs occupy a central position and are beliefs related to how a person describes him/herself. Moreover, he states that the other types of beliefs are fed by these beliefs. Type C beliefs are authority beliefs that specify individuals' thoughts about knowledge and sources of knowledge. Type D beliefs are ideological beliefs derived from authority beliefs, while Type E beliefs are peripheral beliefs related to individuals' pleasure. According to Rokeach's (1968) approach, beliefs located at the center shape beliefs found in more superficial locations than themselves. Therefore, changing a central belief implies also changing a number of peripheral beliefs that are in interaction with that belief. Hence, changing a central belief means bringing about a systematic change in an individual's world of beliefs. In this context, since Type A and Type B beliefs are shaped from birth onwards and are directly related to experiences, they are defined as central beliefs. On the other hand, since authority beliefs (Type C) determine ideological beliefs (Type D), Type C beliefs occupy a more central position than Type D beliefs. Finally, Type E beliefs are defined as a superficial belief type that has the weakest relationship with the other belief types.

According to this approach, university students' online self-efficacy beliefs and social presence related to online environments can be evaluated within the scope of Type A and Type B beliefs, which are central beliefs. Although a sufficient level of empirical data about online self-efficacy beliefs and social presence in online environments is not encountered in the literature, these beliefs do include people's self-descriptions, as stated above. In this context, the online self-efficacy beliefs, and social presence in online environments of the university students included in this study are included within the scope of the central Type A and Type B beliefs.

Although the online self-efficacy beliefs and social presence in online environments of the university students included in this study are both included within Type A and Type B beliefs, online self-efficacy beliefs are considered to occupy a more central position than online social presence. This consideration was made in line with the limited empirical findings in the literature. For example, Ustundag and Guyer (2017) stated that there was a weak positive correlation between students' academic success and their perceptions of social presence. In their study conducted within the frame of a learning community, Shea and Bidjerano (2009) revealed that university students' self-efficacy and students' effort was dynamically related to instruction and social presence. Joo et al. (2013) reported in their study carried out on university students that their perception of self-efficacy in online learning environments was a predictor of their academic success. Moreover, the findings in Wu, Tennyson and Hsia's (2010) study revealed that interaction had a significant effect on learning climate and that self-efficacy and interaction had a significant effect on students' performance. In a similar study, Ercan et al. (2017) determined that there was a positive linear relationship between education faculty students' self-efficacy beliefs towards educational technology standards and their social presence levels regarding e-learning environments.

On the other hand, Type C beliefs, which specify individuals' opinions about knowledge and sources of knowledge, include their epistemological beliefs (Bahcivan & Cobern, 2016; Bahcivan 2017; Gunes & Bahcivan 2018). According to Rokeach (1968), Type C beliefs include individuals' beliefs about source of knowing. In this context, Type C beliefs may correspond to epistemological beliefs specified in the related literature (Bahcivan & Cobern, 2016; Bahcivan 2017; Gunes & Bahcivan 2018). As Hofer and Pintrich (1997) pointed out, individuals' epistemological beliefs affect their approaches to learning and teaching and, therefore, their teaching-learning conceptions. From this point of view, also considering the empirical findings stated in the literature, university students' teaching-learning conceptions are accepted as their Type D beliefs.

Studies can be found in the literature which state that the use of technology is related to self-efficacy, epistemological beliefs and teaching-learning conceptions. In this context, in the studies examined, it is

stated that individuals' beliefs influence their behaviors and self-efficacy (Bahcivan & Cobern, 2016; Fives & Buehl, 2012; Pajares, 1992; Rokeach, 1968). On the other hand, it is indicated that university students' epistemological beliefs occupy a more central position than their teaching-learning conceptions, in other words, that university students' epistemological beliefs can determine their teaching-learning conceptions which are directly related to students' technology use (Brownlee et al., 2002; Hofer & Pintrich, 1997).

Self-efficacy: Educators have conducted studies revealing that beliefs of students at various levels towards their academic abilities have a significant effect on their success levels and on the quality of their learning (Kapucu & Bahcivan, 2015; Aydin & Demir Atalay, 2014). One of these studies conducted on students' self-beliefs is that of self-efficacy perception. Bandura (1977) expresses self-efficacy as an individual's beliefs regarding how well he/she can perform the actions required to deal with potential situations. Zimmerman (1995), however, defines self-efficacy as an individual's judgements of his/her ability to carry out and succeed in a task. Aydin and Demir Atalay (2014), on the other hand, express self-efficacy as individuals' belief that they have the necessary cognitive, motivational, and behavioral resources to be able to control events in their lives and that they have the capacity to activate these resources when required. Moreover, self-efficacy is a key concept of Social Cognitive Theory, which defends the idea that individuals need to have self-confidence before they can use the skills that they possess effectively (Pajares, 2002). If we deal with this concept in an online learning context, it can be defined as an individual's belief in his/her ability to organize and perform the relevant actions for carrying out online tasks or activities.

Examining self-efficacy studies from an online learning viewpoint, Alqurashi (2016) states that recent self-efficacy studies in the literature mostly focus on the technological dimension and stresses that the number of multi-dimensional studies examining self-efficacy in online learning environments is limited. Moreover, he states that when revealing the relationships between self-efficacy and online learning, studies that are not limited only to computers, the internet and searching for information and that deal with the subject multi-dimensionally can make significant contributions to the literature.

Social Presence: The concept of social presence has been defined in different ways by a number of researchers over the years. Short et al., (1976) explain social presence as the degree to which an individual is perceived as a real person in interpersonal communication, while Garrison (1997) expresses it to be the degree to which individuals project themselves in the environment. McLellan (1999) defines social presence as the feeling of being present with other people in a social environment, Garrison et al., (1999) define it as the ability of learners to project themselves as real individuals in a social and emotional sense, while Leh (2001) expresses it as an individual's feeling socially present in an environment.

The above definitions explain the concept of social presence independently of online environments. When the concept of social presence is considered from the viewpoint of online learning environments, it is expressed as the degree to which one feels the presence of other participants in an interactive environment, or as a student's perception of being part of an online course (Picciano, 2002; Whiteman, 2002). Tu and McIsaac (2002) define social presence as the degree of feeling and perception towards other individuals in an online environment and reaction shown to a computer-based communication network, while Biocca et al. (2003) define it as the perception of being with other people in e-learning environments. Kreijns (2004) defines social presence as the ability of participants to perceive other participants in the environment as real individuals, while Arbaugh et al. (2008) define it as the ability to develop interpersonal relationships by reflecting one's own personal characteristics.

The concept of social presence, which has been discussed in different ways over the years, has especially been examined more in the context of online environments recently. The perception of social presence possesses a complex structure. When the concept of social presence first appeared, it was used to explain how individuals experienced communication activity in a communication tool. However,

in the course of time, social presence studies conducted on the subject of online communication tools revealed that individuals' social presence perceptions and their adaptation efforts experienced in communication processes were more important than the communication tool itself (Lowenthal, 2010). Later studies, however, provided clues regarding the degree to which learners' social presence perceptions were related to their satisfaction with a course that they took, with the instructor for that course and sometimes with what they had learnt (Seferoglu et al., 2011).

When entering a new environment, not knowing other people, and feeling like a stranger to that environment can be a serious source of anxiety and stress for individuals. Participants who cannot establish a social connection with other members of an online environment may feel unhappy and lonely in such an environment and wish to return to the real world (Aragon, 2003). There are a number of studies which reveal that social presence has significant effects on communication in online learning environments. In this context, not only is it stated that social presence is directly related to learner-learner communication (Tu, 2000) and that it is a motivation and incentive for students (Moore & Kearsley, 2005), but it is also reported to be effective in critical learning (Richardson & Swan, 2003). Studies have shown that students' perceptions related to social presence are related to the satisfaction they feel towards their teachers and sometimes also towards their learning (Lowenthal, 2010). Tu (2007) states that in online learning environments, social presence is one of the most important factors in the development of educational effectiveness. Moreover, it is revealed in the studies made that interaction, which is one of the most important components of social presence, has a significant effect on students' success (Leh, 2001; Richardson & Swan, 2003; Tu & McIsaac, 2002). When considering the studies conducted in this context, social presence is revealed to be a significant variable in online learning environments.

Epistemological Beliefs: These beliefs encompass people's views and beliefs about knowledge and knowing (Hofer & Pintrich, 1997). Studies conducted in this field and focusing on a multidimensional approach deal with epistemological beliefs within the contrast between naïve and sophisticated. While the naïve aspect represents a weak epistemological belief in terms of quality, the sophisticated side represents a qualified belief. According to Schommer (1990; 1994; 2004), individuals' epistemological beliefs can be evaluated in three dimensions. The first of these dimensions is the certainty dimension of knowledge, that is, the one that focuses on the constancy of knowledge. In this dimension, individuals with naïve beliefs believe that knowledge is certain and unchangeable. On the other hand, individuals with sophisticated beliefs accept that knowledge is a changing and regenerating phenomenon. As its name implies, the simplicity dimension of knowledge examines beliefs aimed at how simple or complex a structure knowledge contains. While naïve individuals believe that knowledge contains simple and mutually disconnected structures, those with sophisticated beliefs believe that knowledge contains complex and interrelated micro-parts, and that therefore, it is difficult to conceive completely. Finally, the source dimension of knowing examines the roles of authorities in the nature of knowing. Whereas naïve beliefs accept that sources such as teachers, course books and scientists are the source of knowing, sophisticated ones mean that the individual manifests himself at the source of knowing (Sinatra et al., 2014).

Making a comparison of all the epistemological models in the literature, Hofer and Pintrich (1997) took the emphasis of the developmental perspective on justification for knowing into consideration and added this dimension to Schommer's belief system. While naïve beliefs in the justification dimension consider the agreement among authorities regarding the act of knowing, sophisticated beliefs emphasize the necessity for knowing to be carried out on an individual level by means of logic and evidence. According to Hofer and Pintrich (1997), the 'justification' and 'source' dimensions of these four dimensions include individuals' beliefs about the nature of knowing. On the other hand, the 'certainty' and 'simplicity' dimensions include beliefs about the nature of knowledge.

Empirical studies show that the epistemological beliefs of students at different levels affect their success levels and conceptual understanding. For example, Hofer (2000) revealed that university students'

epistemological beliefs predicted their success in psychology class. He revealed that students who believed that the science of psychology was simple and certain (naïve beliefs) had low success scores. Similarly, Stathopoulou and Vosniadou (2007) revealed that high school students who held sophisticated (epistemological) beliefs were more successful than students with naïve beliefs regarding 'force and motion'. Some researchers (Duit & Treagust, 2003; Qian & Alvermann, 1995) have pointed out that epistemological beliefs can affect students' readiness for conceptual change. This situation has also been confirmed by the results of conceptual studies made at the fifth-grade level (Mason et al., 2008).

A number of scientific studies have been carried out on the effects of epistemological beliefs on learning, together with their causalities. For example, Gunes & Bahcivan (2018) demonstrated that university students' epistemological beliefs influenced their conceptions of teaching and learning and their digital literacy. Also, Hofer and Pintrich (1997) stated that epistemological beliefs were central beliefs related to teaching and learning considering the previous findings in the literature. Therefore, a researcher can expect that distance learning students' epistemological beliefs might have an effect on their teaching-learning beliefs since technology is utilized for learning purposes during distance learning courses. However, a sufficient number of studies in the context of teaching beliefs and practices is not found in the literature. In this context, there is a need for research into why and how epistemological beliefs affect the conception of teaching and learning.

Conceptions of Teaching and Learning: Conceptions of teaching and learning (COTL) can be explained as personal descriptions regarding what people's teaching and learning is and how this process should be (Chan & Elliott, 2004). Studies in this field began with phenomenological studies examining students' learning conceptions (Marton et al., 1993; Saljo, 1979). Memorising, increase of knowledge, and understanding are some examples of these conceptions. Moreover, a number of researchers examined teachers' and preservice teachers' conceptions of teaching and they characterized these as information transfer, interaction and constructivism (Koballa et al., 2000; Tsai, 2002). The conducted studies reveal that preservice teachers' conceptions of learning are consistent with their conceptions of teaching (Tsai, 2002). Chan and Elliott (2004) stated that although different labels were used for university students' conceptions of teaching and learning (COTL), it would be suitable to classify these as constructivist and traditional.
A teacher candidate with a traditional understanding believes that students are passive learners and that their teachers are the source of knowledge. On the other hand, a teacher candidate with a constructivist understanding defines learning as an active process of participation and accepts that teachers, by drawing attention to previous knowledge and experiences, are merely the students' guides. Sang et al., (2010) state that preservice teachers who have a constructivist understanding lean towards adapting digital technologies in the learning and teaching processes. Moreover, some researchers have revealed findings showing that university students' conceptions of teaching and learning have an effect on their classroom practices (Koballa et al., 2005).

The Hypotheses and the Proposed Model

In order to examine the research problem, the structural model shown in Fig. 1 was proposed. The relationships among the university students' online self-efficacy beliefs, social presence in online environments, epistemological beliefs and teaching-learning conceptions expressed in the model are based on Rokeach's (1968) belief system approach.

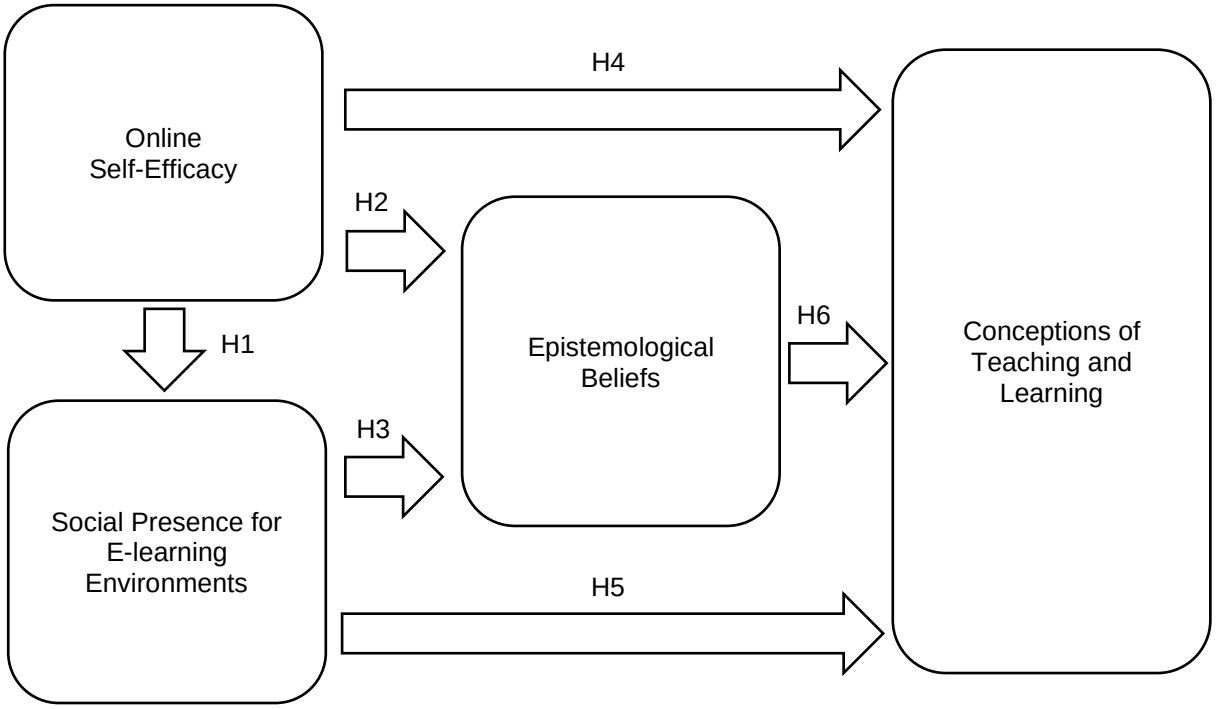

Figure 1. Suggested research model.

At the same time, studies exist which show that teaching-learning conceptions are also related to the use of technology. The results of some experimental studies have revealed that teachers with a constructivist understanding of teaching and learning use technology in the teaching process at higher rates than teachers who have a traditional approach towards teaching and learning (Hernandez-Ramos, 2005; Martin & Schulman, 2006). Moreover, some researchers state that university students' teaching-learning conceptions are predictors of the extent to which they use technology in their future teaching practices (Han et al., 2017; So et al., 2012).

The research model prepared by considering the theoretical and empirical studies indicated above and presented in Fig. 1 contains six (6) research hypotheses.

- H1: University students' online learning self-efficacy beliefs positively predict their levels of social presence in online environments.
- H2: University students' online learning self-efficacy beliefs positively predict their epistemological beliefs.
- H3: University students' levels of social presence in online environments positively predict their epistemological beliefs.
- H4: University students' online learning self-efficacy beliefs positively predict their teaching-learning conceptions.
- H5: University students' levels of social presence in online environments positively predict their teaching-learning conceptions.
- H6: University students' epistemological beliefs positively predict their teaching-learning conceptions.

Purpose of the Study and Problem Statement

The aim of this study was to examine the relationships among online self-efficacy beliefs, social presence in online environments, epistemological beliefs and teaching-learning conceptions of university students taking campus-based courses via distance learning. For this purpose, an attempt was made to find an answer to the following research problem:

- What are the relationships among university students' online self-efficacy beliefs, social presence in online environments, epistemological beliefs, and teaching-learning conceptions?

Methodology

Research Design

This research was designed as a quantitative study, and was conducted with a cross-sectional approach, which is actually a type of survey study. Survey studies are scanning studies carried out in a universe composed of many elements, and, in order to reach a general judgement, with the entire universe or with a specific sample taken from that universe. Studies made with the cross-sectional approach, however, are studies of separate groups whose development is considered to represent various developmental stages and who are observed at a specific point in time and all at the same time (Fraenkel et al., 2012).

Study Group

In the spring term of the 2017-2018 academic year, there were 9,344 students taking at least one of the campus-based common compulsory courses (Atatürk's Principles and Revolutionary History, Foreign Language, and Turkish Language) via distance learning at the university. The scales used for data collection in the study were applied over two separate periods of time. Although the scales were completed voluntarily by 2,245 different students, there were only 1,757 students who completed all the scales. However, it was decided to remove a total of 127 students, who were determined by the various statistical analyses made, to have incompletely or incorrectly filled in the scales, from the data set. Consequently, a total of 1,630 students from various departments of the university who participated voluntarily in the research made up the data set of the study. A convenience sampling method was applied throughout the study. The demographic distributions, according to gender, age, grade level and type of school, of the students who took part in the study are shown in Table 1.

Table 1. Demographic Distributions of Participants

Variable	Group	Number	Percentage (%)
Gender	Female	1115	68.40
	Male	515	31.60
Age	19 and below	491	30.12
	20	555	34.05
	21	278	17.06
	22	139	8.53
	23	66	4.05
	24	33	2.02
	25 and over	68	4.17
Class	1 (Freshman)	1046	64.35
	2 (Sophomore)	355	21.78
	3 (Junior)	140	8.59
	4 (Senior)	86	5.28
Type of school	Faculty	1089	66.81
	College	226	13.86
	Vocational School	315	19.33
Total		**1630**	**100**

As can be seen in Table 1, of the students who formed the study group, 515 were male and 1,115 were female. Examining age distribution of the students, it is seen that a great majority belonged to the 21 and underage groups. Since the campus-based common compulsory courses are generally first-grade courses, when the grade levels of the students are examined, it is seen that the majority of the sample consisted of first-grade students. Examining the distribution of the students' school types, it is seen that out of a total of 1,089 faculty students in 11 different faculties, 355 of these were in the Education Faculty, 323 attended the Economics and Administrative Sciences Faculty and 148 studied in the Faculty of Science and Letters; out of a total of 226 college students at 6 different colleges, 69 attended Health College, 58 studied at the College of Physical Education and Sport and 54 were at College of Applied Sciences; and out of a total of 315 vocational school students at 7 different vocational schools, 76 were at Vocational School, 68 attended School of Technical Sciences and 54 studied at the Health Services School. Moreover, it was observed that in the university as a whole, students from 107 different departments participated in the study and that the highest participation was from the Nursing (56),

Business Administration (56) and English Teaching (53) departments. Since a comparison aimed at ascertaining whether there were significant differences between departments was not undertaken, it is not considered important if a low number of students participated from any particular department. Therefore, the fact that a low number of students participated from the Medical Faculty (3), the Fashion Design Department (2) and the Foreign Trade Department (2) did not result in the removal of these data from the sample.

The data was collected from students at a state university involving faculties, colleges, and vocational schools. Faculties offer at least 4-year education (4-year for faculty of education and 6-year for faculty of medicine), colleges offer 4-year education and vocational schools provide 2-year education programs.

Data Collecting Tools

In this study, 4 scales were used as data collection tools. These scales were: the online learning self-efficacy scale (OLSES), the social presence scale for online learning environments, the scientific epistemological beliefs scale and the conceptions of teaching and learning (COTL) scale.

The Instrument

Online Learning Self-Efficacy Scale (OLSES): The online learning self-efficacy scale was developed by Zimmerman and Kulikowich (2016). The original form of the scale consists of 22 items distributed to 3 factors (learning in the online environment, time management and technology use). The adaptation study of this scale into Turkish was conducted by the authors of the present study (Yavuzalp & Bahcivan, 2020). It was stated that as a result of the explanatory factor analysis performed for the adaptation study, one item (factor loading <.40) was removed from the scale, and that the original three-dimensional structure of the scale appeared as one-dimensional in its Turkish form. It was reported by the researchers that as a result of the analysis of the single-factor structure and the 21 items that appeared in the OLSES scale, the factor loading distributions of the items ranged between .845 and .921. Also, the internal consistency (Cronbach's alpha) coefficient of the scale was .981, indicating a high degree of reliability.

According to the results of the confirmatory factor analysis (n=1630) performed within the scope of this study, the scale in this form has acceptable fit indices ($\chi 2/df$= 7.28, p<.001; CFI=.96; RMSEA=.07; NCP=1074.25; ECVI=.838). The factor loadings ranged between .69 and .84, while the Cronbach's alpha reliability results for the scale were found to be .97. When the general results related to the confirmatory processes are considered, it can be stated that the scale is able to produce valid and reliable results.

Social Presence Scale for Online Learning Environments: The social presence scale for online learning environments was developed by Kilic-Cakmak et al. (2014). Developed in order to determine students' levels of social presence in online learning environments, the five-point Likert-type scale consists of 3 dimensions (interactive, cohesive and affective) and a total of 17 items. It was reported that the interactive dimension consisted of 7 items with factor loadings ranging between .46 and .69; that the cohesive dimension consisted of 5 items with factor loadings ranging between .59 and .79; and that the affective dimension consisted of 5 items with factor loadings ranging between .53 and .74. It was stated that all factors explained 51.40% of the total variance, that the interactive factor explained 18.45% of the total variance, that the cohesive factor explained 18.16% of the total variance, and that the affective factor explained 14.79% of the total variance. Moreover, it was determined that as a result of the confirmatory factor analysis performed on the three-factor model that emerged, the goodness of fit indices were $\chi 2/df$=2.17; RMSEA= .07; GFI= .90; AGFI= .85; CFI=.95; NFI= .95; SRMR= .06. To determine the reliability of the scale, the Cronbach's alpha internal consistency coefficient was examined, and the Cronbach's alpha reliability for the whole scale was found to be .83, the Cronbach's

alpha for the interactive factor was .76, the Cronbach's alpha for the cohesive factor was .81, and the Cronbach's alpha for the affective factor was .75 (Kilic-Cakmak et al., 2014).

Within the scope of the present study, confirmatory factor analysis (n=1630) was performed in order to ensure the structural validity of the social presence scale. As a result of the confirmatory factor analysis, 3 items with low factor loadings were removed from the scale. Two of these items belonged to the interactive subdimension, while one belonged to the cohesive subdimension. Following repeated analysis, the results of the confirmatory factor analysis for the social presence scale produced acceptable fit indices ($\chi 2/df = 5.97$, $p<.001$; CFI=.98; RMSEA=.06; NCP=287.97; ECVI=.29). It was seen that the factor loadings of the scale ranged between .53 and .85, and the Cronbach's alpha reliability values were calculated as .86 for the interactive subdimension, .90 for the cohesive subdimension, and .77 for the affective subdimension.

Scientific Epistemological Beliefs Scale: This scale was developed by Conley et al. (2004) to measure the scientific epistemological beliefs of individuals in different age groups. The scale contains a total of 26 Likert-type items distributed in 4 different dimensions. These dimensions are named as the certainty (6 items), development (6 items), source (5 items) and justification (9 items) of knowledge. In the dimensions for certainty and source of scientific knowledge, all the items are recoded, thereby ensuring that high scores obtained in the scale represent sophisticated beliefs. This scale was previously adapted to Turkish by the Bahcivan (2014) with a sample made up of preservice science teachers, and was reported to have fit indices at acceptable levels ($\chi 2/df=1.44$, CFI= .95, TLI= .93 and RMSEA= .04). In the same study, the Cronbach's alpha reliability values were observed to range between .66 and .82. Within the scope of the present study, instead of the four-dimensional structure determined in the original scale, the two-dimensional structure suggested by Hofer and Pintrich (1997) was taken into consideration. Accordingly, while the source and justification of knowing formed the dimension comprising beliefs towards the nature of knowing, the certainty and development of knowledge were accepted as the nature of knowledge dimension. Results indicated that the nature of knowing dimension included 9 items whereas the nature of knowledge dimension included 5 items.

According to the results of the confirmatory factor analysis (n=1630) performed within the scope of this study, the scale in this form has acceptable fit indices ($\chi 2/df= 5.78$; $p<.001$; CFI=.98; RMSEA=.05; NCP=459.31; ECVI=.39). The factor loadings ranged between .74 and .89, while the Cronbach's alpha reliability results for the scale subdimensions were found to be .93 for nature of knowing and .87 for nature of knowledge. When the general results related to the confirmatory processes are taken into account, it is considered that the scale is able to produce valid and reliable results.

Conceptions of Teaching and Learning Scale (COTL): The conceptions of teaching and learning scale was developed by Chan and Elliott (2004) to determine inservice/preservice teachers' conceptions. In the Likert-type scale, consisting of 30 items, a five-point scoring system is used (1=I completely disagree – 5=I completely agree). One of the scale subdimensions consists of 12 constructivist items (learning implies that opportunities have been given to students for them to examine, discuss and express their ideas), while the other subdimension consists of 18 traditional items (learning means remembering what the teacher has taught). High scores obtained in these dimensions correspond to teacher candidates who have the relevant understanding. The fit indices of the scale, the Turkish adaptation of which was made by Eren (2009), were reported to be at acceptable levels ($\chi 2/df=2.42$; NNFI=.93; CFI=.94; RMSEA=.061), and the Cronbach's alpha reliability coefficients for the subdimensions were stated to be .92 for the constructivist subdimension and .89 for the traditional subdimension.

Moreover, within the scope of the study, the confirmatory factor analysis (n=1630) was repeated in order to ensure the structural validity of the COTL scale. The fit indices obtained as a result of the analysis are at acceptable levels ($\chi 2/df=7.17$, $p<.001$; CFI=.94; RMSEA=.06; NCP=2305.57; EVCI=1.76). The factor loadings of the scale items ranged from .52 to .84 and at the same time, the Cronbach's alpha

reliability values for the scale subdimensions were calculated as .95 for the constructivist subdimension and .93 for the traditional subdimension. As a result of the analyses made, it can be said that the COTL scale can produce valid and reliable results.

Data Collection Process

Before the data collection process began, we took permission of researchers who developed the scales presented above. Then, we applied for ethical permission from the university's human research committee. In order to accelerate the data collection process, reach a greater number of participants and reduce the number of items that the students had to respond to in one go, the scales were divided into 2 groups. For this division, the number of items in the scales was considered, and for the first group, the social presence scale (17 items) and COTL (30 items) were chosen, while the OLSES (22 items) and epistemological beliefs scale (26 items) were selected for the second group. The scales were implemented as online questionnaires via the university's distance learning management system (LMS) through which the study was carried out. Each scale group was published on the LMS for a period of 4 weeks and all students entering the system were given the opportunity to respond. Since each pair of questionnaires, which were completed voluntarily by students taking campus-based common compulsory courses via distance learning, was kept open on the LMS for a period of 4 weeks, the data collection process took a total of 8 weeks. Data belonging to students who responded the scales for both groups were matched on SPSS. This matched data was utilized for statistical analyses.

Data Analysis

It was decided to select the responses of the students who replied to all four of the different scales from which data were gathered within the scope of the study. As a result of the study carried out in this context, it was seen that the data of 1,757 students formed the overlapping set for the scales. In the study, before moving on to the data analysis, the multivariate normality, linearity analysis, removal of outliers and determination of missing data were examined in order to reveal whether the data were suitable for analysis and whether they met the hypothetical criteria. Accordingly, skewness and kurtosis values were observed below than 3.0 (Stevens, 2009). For this purpose, responded scales in which more than one item was left blank were removed from the study data. For the scales that remained after the exclusion of the missing or faulty data, outlier and normality analyses were performed. After all, the analyses had been made and the missing/faulty data (127) had been removed, the responses of 1,630 students formed the study data. Therefore, the sample size was accepted as appropriate for structural equation modeling since it is more than 200 (Tabachnick et al., 2007).

It was aimed to reveal the predictive relationships among the research variables related to the problem statement determined within the scope of the research. For this purpose, by also taking the suitability of the sample into account, the main analysis method for the study was determined as structural equation modelling. With the aim of examining the relationships between the online self-efficacy beliefs, the social presence in online environments, epistemological beliefs, and teaching-learning conceptions of students in higher education, a structural equation model analysis was conducted by means of the AMOS software package.

Findings and Discussions

Descriptive Findings

Certain descriptive results including means and standard deviation for each latent variable were presented in Table 2. Means were calculated for per item in the latent variable. Accordingly, mean scores were observed as higher than mid-point which was 3 for all the dimensions.

Table 2. Descriptive Findings for Latent Variables

Variables	Mean	N	Std. Dev	Std. Err
1. Self-Efficacy	3.50	1630	.76	.02
2. Social Presence	3.29	1630	.74	.02
2.a Social Presence (affective)	3.01	1630	.89	.02
2.b Social Presence (interactive)	3.44	1630	.81	.02
2.c Social Presence (cohesive)	3.41	1630	.82	.02
3. Conceptions of Teaching and Learning (COLT)	3.55	1630	.61	.02
3.a COLT (constructivist)	3.84	1630	.75	.02
3.b COLT (traditional)	3.27	1630	.69	.02
4. Epistemological Beliefs	3.28	1630	.58	.01
4.a Epistemological (Nature of Knowing)	3.55	1630	.72	.02
4.b Epistemological (Nature of Knowledge)	2.90	1630	.82	.02

Furthermore, correlation matrix was presented in Table 3 which showed that all the latent variables were significantly related to each other, except for the relationship between nature of knowledge and constructivist variables. Therefore, we decided to continue with structural equation modeling analysis.

Table 3. Correlation Matrix

Variables	1	2	3	4	5	6	7	8	9	10	11
1. Self-Efficacy	1										
2. Social Presence (SP)	.38**	1									
3. SP (affective)	.23**	.83**	1								
4. SP (interactive)	.38**	.89**	.56**	1							
5. SP (cohesive)	.40**	.91**	.60**	.79**	1						
6. COLT	.37**	.49**	.32**	.49**	.48**	1					
7. COLT (constructivist)	.43**	.49**	.24**	.55**	.52**	.86**	1				
8. COLT (traditional)	.19**	.32**	.31**	.26**	.28**	.83**	.43**	1			
9. Epistemological Beliefs (Ep)	.62**	.34**	.26**	.32**	.32**	.37**	.32**	.31**	1		
10. Ep (Nature of Knowing)	.69**	.33**	.17**	.36**	.34**	.37**	.46**	.15**	.83**	1	
11. Ep (Nature of Knowledge)	.20**	.17**	.21**	.11**	.12**	.19**	-0.02	.37**	.68**	.19**	1

Structural Relations

The relationships between the online self-efficacy beliefs and the social presence in online environments, epistemological beliefs and teaching-learning conceptions of university students taking campus-based courses via distance learning were examined by structural equation modelling analysis. The structural model showing the significant relationships was presented in Fig. 2. The analysis reveals that the model has acceptable fit values ($\chi 2/df=4.84$; $p<.001$; CFI= .89; RMSEA= .05; NCP=11239.27; ECVI=9.08). The model explained 41% variance of constructivist conceptions whereas 16% variance of traditional conceptions.

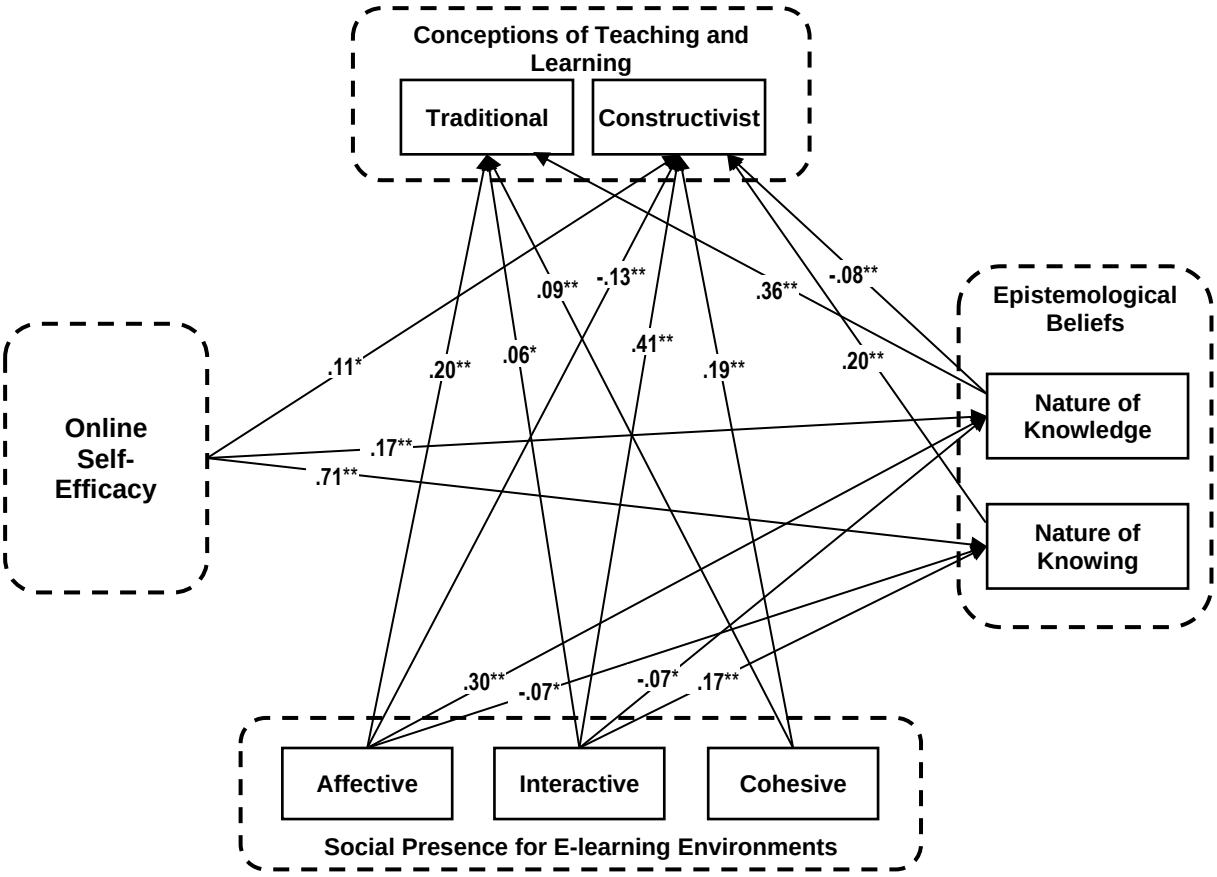

Figure 2. Observed relationships in suggested model (*p< .01, **p< .001).

No statistically significant relationship was observed between the online self-efficacy beliefs and social presence in online environments of students taking campus-based courses via distance learning (H1). On the other hand, as expected, it was seen that the university students' online self-efficacy beliefs had a positive effect on their epistemological beliefs (H2). In other words, it was observed that as the participants' online self-efficacy beliefs increased, their epistemological beliefs towards the nature of knowledge and knowing were able to take on a more sophisticated form. Furthermore, the university students' online self-efficacy beliefs were observed to significantly predict their teaching-learning conceptions (H4). However, it was seen that their online self-efficacy beliefs did not have any effect on their traditional beliefs, whereas they were able to positively affect their constructivist beliefs. In other words, it is seen that a university student whose online self-efficacy beliefs increase can have a more constructivist perspective on teaching and learning.

It was observed that the university students' social presence in online environments was a significant predictor of their epistemological beliefs (H3). That is to say, with respect to social presence, it is seen that students who have a positive view in an affective sense possess sophisticated beliefs towards the nature of knowledge, whereas they have naïve beliefs towards the nature of knowing. In the interactive dimension, however, while a positive effect was observed about the nature of knowledge, a negative effect was observed with regard to the nature of knowing. Moreover, it was seen that the university students' social presence in online environments affected their conceptions of teaching and learning (H5). However, this effect of the level of social presence is partially coherent with our expectations. For example, it was observed that obtaining high scores in the interactive and cohesive dimensions positively predicted both constructivist and traditional conceptions. However, in the context of these two dimensions, it was seen that the regression weights that predicted traditional conceptions had lower values than those predicting constructivist conceptions. Nevertheless, examining the relationships

between the affective dimension and teaching-learning conceptions, it was observed that individuals who described themselves as more active in online learning environments had traditional conceptions. Finally, examining the relationships between epistemological beliefs and conceptions of teaching and learning, while sophisticated beliefs towards the nature of knowledge were observed to be positive predictors of traditional beliefs, they were observed to negatively predict constructivist beliefs. This observation indicates an inverse relationship regarding our hypotheses. Moreover, it was seen that epistemological beliefs towards the nature of knowing positively triggered beliefs towards constructivist conceptions, whereas they did not significantly affect beliefs towards traditional conceptions. This finding is in partial accordance with our hypothesis (H6).

Discussions

Considering the findings related to the structural model with which the proposed hypotheses were tested in line with the research aim, it is seen that H1 was rejected, that H2, H3 and H4 were confirmed, and that H5 and H6 were partially confirmed.

In contrast to the findings of empirical studies in the literature, in the present study, no significant relationship was found between the university students' online self-efficacy beliefs and their social presence in online environments. This situation contradicts some research findings in the literature (Ercan et al., 2017; Shea & Bidjerano, 2009). However, although a direct relationship between online self-efficacy beliefs, expressed as Type A and Type B beliefs, and social presence was not found, it may be considered that since they affect the same psychological variables, there is an indirect relationship between them (Rokeach, 1968). Previous empirical findings (e.g. Joo et al., 2013) already pointed out that there might be an indirect relationship between self-efficacy beliefs and social presence. Additionally, the scales utilized in the study might lead to handling statistically non-significant relationships between these variables. On the other hand, it was seen that as expected, the university students' online self-efficacy beliefs positively predicted their epistemological beliefs. This observed situation is similar to the results found and claims made in similar studies (Bahcivan & Cobern, 2016; Fives & Buehl, 2012; Pajares, 1992). Furthermore, it was observed that the university students' online self-efficacy beliefs were significant predictors of their conceptions of teaching and learning. It was observed that although their online self-efficacy beliefs had no effect on their traditional beliefs, they could, on the other hand, have a positive effect on their constructivist beliefs. Some studies conducted in this context (Hernandez-Ramos, 2005; Martin & Schulman, 2006) reveal that teachers who have constructivist conceptions of teaching and learning use technology in the teaching process at higher rates than teachers who have traditional teaching-learning conceptions. Based on this, it is considered that individuals who adopt a constructivist understanding may be more willing to use technology, and that this situation may be related to their levels of self-efficacy and social presence in online environments. Considering these findings, it can be speculated that increasing university students' self-efficacy beliefs and social presence may contribute positively to the quality of constructivist learning environments.

Moreover, it was seen that the participants' social presence in online environments significantly predicted their epistemological beliefs to a certain extent. For example, the findings revealed that there was a positive and significant predictive relationship between social presence and beliefs towards the nature of knowledge in the affective dimension, whereas there was a negative relationship between social presence and beliefs towards the nature of knowing. This situation is also revealed in the belief system model proposed by Rokeach (1968), in which it is stated that central beliefs shape peripheral beliefs. However, the study findings showed that not all the relationships also specified here were found in the specified way in the hypotheses. This situation may be indicative of cultural differences (Bahcivan & Cobern, 2016).

The study findings reveal that the university students' social presence in online environments predicted their conceptions of teaching and learning. However, as stated above, this finding is only in partial accordance with our expectations. For example, it was seen that high scores obtained in the interactive and cohesive dimensions positively predicted teaching-learning conceptions in both dimensions. However, in the context of these two dimensions, it was seen that the regression weights that predicted traditional conceptions had lower values than those predicting constructivist conceptions. This finding, which falls outside our expectations, should be supported by additional research. On the other hand, the revealed findings do appear to validate the empirical data in the belief system model proposed by Rokeach (1968).

Finally, when the relationships between epistemological beliefs and teaching-learning conceptions were examined, it was observed that epistemological beliefs towards the nature of learning predicted teaching-learning conceptions with a regression weight that was contrary to our expectations. That is to say, it was seen that traditional learning conceptions were positively triggered in participants who had sophisticated beliefs towards the nature of knowledge, whereas constructivist conceptions were negatively triggered. This situation conforms to studies indicating the relationship between epistemological beliefs and conceptions of teaching and learning (Brownlee et al., 2002; Hofer & Pintrich, 1997). However, the fact that the relationships again appear contrary to expectations indicates the need to take cultural variables into consideration (Bahcivan & Cobern, 2016). To sum up university students' online self-efficacy beliefs, social presence for e-learning environments as well as their epistemological beliefs was observed as effective on their conceptions of teaching and learning.

Limitations, Conclusion and Recommendations

All the data of this study were collected from students at a state university in Turkey. Therefore, results might have cultural limitations. Also, the data of the study were collected solely through Likert scales which did not involve any direct observation about participants' exact beliefs and behaviors.

It is seen in the above sections that the levels of online self-efficacy beliefs and social presence in online environments, expressed as Type A and Type B beliefs in relation to the model revealed at the basis of Rokeach's (1968) belief system, had effects on the university students' epistemological beliefs and conceptions of teaching and learning. In light of the results obtained, it can be stated that the more centrally-located Type A and Type B beliefs were predictors of Type C and Type D beliefs. These findings support Rokeach's (1968) belief system.

Considering the findings of the research, it can be said that studies on the positive effects of university students' online self-efficacy beliefs and social presence in online environments will have positive effects on their epistemological beliefs and conceptions of teaching and learning.

In light of the results obtained, it is recommended that studies are conducted aiming at developing the online learning self-efficacy of students taking courses in online learning environments and at supporting their feeling of being part of the online environment (social presence), since developing university students' self-efficacy beliefs (Joo et al., 2013) and supporting the learning climate through interaction (Wu et al., 2010) affects students' academic performance to a considerable extent. Furthermore, increasing students' levels of social presence also contributes to their academic success (Tsai et al., 2011; Ustundag & Guyer, 2017).

In this context, preparing different online learning environments aimed at increasing university students' levels of self-efficacy can enable the consolidation of positive experiences in this area and thereby ensure support for their self-efficacy. These learning environments may involve guides, online tutorials, and online learning materials considering individual differences related to learning. Studies can be made on the subject of giving more importance to online interaction in order to develop students' levels of

social presence. The results obtained in the study can be shared in information activities intended for teaching staff who give campus-based courses via distance learning. Moreover, based on certain findings that were contrary to expectations and hypotheses, it is considered that the addition of various cultural variables to studies in this field can contribute to the formation of a more holistic point of view.

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