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Research Article

Predictors of University Students' Attitudes Towards Online Learning: A Mixed-Methods Study on Behavioural and Perceptual Variables During the COVID-19 Pandemic

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Abstract – Due to the COVID-19 pandemic, university students have been included in the move to distance education. One of the effective variables in this process is their attitude towards online learning. This study aims to find out the predictors of this attitude by the behaviour and perception variables and the learner experiences during the pandemic. This mixed-method study involved 506 university student participants. Regression and content analysis were used in the analysis of the data. In the results of the study, online learning attitude showed the highest relationship with the sense of online learning community. Behaviour and perception variables including reflective thinking, perceived socialness, knowledge sharing behaviour and the sense of community explain the attitude towards online learning at high levels. In the qualitative part of the study, aspects of distance education the students liked or disliked during the COVID-19 global outbreak process, their thoughts on synchronous/asynchronous class videos, and the contribution of the process to their learning experiences are presented. The results of the research are discussed with specific reference to the pandemic period.

Keywords: online learning attitudes, reflective thinking levels, knowledge sharing behaviors, the sense of community

Introduction

The COVID-19 pandemic, a community health emergency of universal importance, was declared at the beginning of 2020 (Cucinotta & Vanelli, 2020), affecting areas around the world. After the health sector, it has most affected the education sector (Telli Yamamoto & Altun, 2020). Billions of students (Drane, Vernon, & O'Shea, 2020) and staff have been affected by the pandemic and millions of students are in danger of dropping out (Amelan, 2020). Students' attitudes towards school, learning programmes, other students and learning in general and their psychological characteristics are among the important variables to continue learning online (Okur, Paşaoğlu Baş, & Uça Güneş, 2019). Osborn (2001) stated that the attitude towards the teacher, other students and the online learning programme is effective in preventing students from dropping out. University students' attitudes towards online learning are among the determining variables in the intention of continuing online courses in their future educational lives (Zhu, Zhang, Au, & Yates, 2020). While the attitudes of higher education students who voluntarily participate in online learning is a variable that has been frequently researched in the literature (Coelho Junior, Botelho, Rego, Faiad, & Ramos, 2019; Li & Lee, 2016) learning dynamics in the pandemic have completely changed and revealing which variables are affected by online learning variable has become more of an issue.

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Attitudes towards learning, one of the internal factors affecting online learning in higher education, is a variable that facilitates the implementation of education and increases its effectiveness (Mitchell & Geva-May, 2009; Wang, MacArthur, & Crosby, 2003), enabling participation in the online learning community (Khalid, 2019) variables (Chatterjee & Correia, 2020). Online learning communities play a crucial role in structuring learning in higher education, sharing knowledge and social interaction. Knowledge sharing behaviours that work in virtual communities (Jadin, Gnambs, & Batinic, 2013) express one's desire to share knowledge (Yu, Lu, & Liu, 2010). This sharing desire increases in direct proportion to the team-level trust among team members in learning environments that offer highly collaborative technology (Kipkosgei, Kang & Choi, 2020). Online learning communities can be formed using knowledge sharing behaviour that takes place with applications such as social media usage (Kane, Robinson-Combre, Zane & Berge, 2010; Rasheed, Malik, Pitafi, Iqbal, Anser & Abbas, 2020), sharing via weblogs (Yu, Lu, & Liu, 2010), and sharing in Wikipedia (Jadin, Gnambs & Batinic, 2013). These learning communities can come to life through the benefits of knowledge sharing behaviour in a wide range of areas such as business education (Lin & Huang, 2020), professional life experience (Sohail & Daud, 2009; Tong, Tak & Wong, 2013; Nguyen & Malik, 2020), undergraduate and graduate education (Hung, Durcikova, Lai & Lin, 2011; Eid & Al-Jabri, 2016). Considering the educational dimension, positive results can be obtained in terms of the learning performance variable (Eid, & Al-Jabri, 2016; Pangil & Chan, 2014).

Many variables affect attitudes towards learning, including the sense of community and knowledge sharing behaviour. These are important and interrelated in terms of the nature of the interaction in online environments. Supporting studies have been carried out on the sense of community and knowledge sharing behaviours with qualitative data (Yilmaz, 2016); in-depth results can be obtained by carrying out new studies in various fields (Tong, Tak & Wong, 2013) by taking into account variables related to knowledge sharing and using qualitative data. The opportunities offered by information and communication technologies (chat, discussion platforms) affect knowledge sharing (Tong, Tak, & Wong, 2013; Eid, & Al-Jabri, 2016).

Berge and Muilenburg (2005) explain that social interaction takes second place in the list of obstacles to online learning. According to Salmon (2012), although online socialisation plays a key role in learning, it differs according to the dynamics of the face-to-face learning environment (Adnan & Anwar, 2020). The freedom given to students in the online environment can at some point become a feeling of isolation and discomfort (Irwin & Berge, 2006). Social learning environments positively affect attitudes towards online learning (Raspopovic, Cvetanovic, Medan & Ljubojevic, 2017).

Purpose of the research

This study aims to determine the distance education experiences of university students in different fields of study during the COVID-19 pandemic, their attitudes and predictors towards online learning based on these experiences. It seeks answers to the following research questions:

Q1. How do students' attitudes towards online learning, reflective thinking levels, perceived socialness, knowledge sharing behaviours, and sense of community depend on their distance education experiences during the COVID-19 process?

Q2. What is the predictor level of personal variables (gender, age, class, time spent on distance education during COVID-19) and behaviour and perception variables (reflective thinking levels, perceived socialness, knowledge sharing behaviours, the sense of community) regarding students' attitudes towards online learning?

Q3. What student online education experiences are provided by distance education due to COVID 19?

Conceptual Framework

COVID-19 and distance education

COVID-19 was declared a global outbreak by The World Health Organization (WHO) on 30 January 2020 and a pandemic on 11 March 2020 (Cucinotta & Vanelli, 2020). Telli Yamamoto and Altun (2020) say that, after health, education was the profession most affected by COVID-19. Schools have closed in nearly 200 countries (UNESCO, 2020a) and 1.5 billion students worldwide have been affected by the pandemic (Drane, Vernon, & O'Shea, 2020). According to UNESCO's report, 24 million learners are in danger of dropping out (Amelan, 2020). University students, academic staff, non-teaching staff and the educational system have been influenced by the pandemic (UNESCO, 2020b).

During the COVID-19 global outbreak, compulsory distance education started in almost all countries (Akdemir & Kılıç, 2020; Eken, Tosun & Eken-Tuzcu, 2020). While this process proceeds easily in countries with distance education infrastructure, challenges are experienced in countries that are unprepared or economically weak. A similar situation is valid for higher education institutions. Universities with the necessary infrastructure have adapted more easily to the process, while the rest have started to find individual solutions (Eken, Tosun, & Eken-Tuzcu, 2020). Universities that do not have much experience in distance education have started large-scale infrastructure investments (Yavuz, Kayalı, Balat & Karaman, 2020). The distance education tools and applications used by institutions differ from each other (Akdemir & Kılıç, 2020; Yavuz, Kayalı, Balat & Karaman, 2020). Within this period, both synchronous and asynchronous courses are being conducted in line with each university's infrastructure and decisions (Dolmacı & Dolmacı, 2020). Teaching staff are used to traditional face-to-face methods. Since this is not an alternative in the COVID-19 process, all learning stakeholders have had to accept the change (Dhawan, 2020). Students who are involved in distance education prefer face-to-face to synchronised distance education (Dolmacı & Dolmacı, 2020) and are reluctant to take on learning responsibilities (Akdemir & Kılıç, 2020). Students have problems focusing on the compulsory distance education process for motivational, psychological and economic reasons (Akdemir & Kılıç, 2020). In addition, academics without sufficient experience in distance education at the higher education level negatively affect the efficiency of the process (Eken, Tosun, & Eken-Tuzcu, 2020). Students' attitudes towards online learning may not match what is known about previous practice and literature during the COVID-19 pandemic.

Sense of online learning community as a predictor of online learning attitudes

The sense of community is a shared belief in members' sense of belonging, a feeling that members care about each other and the group and that their needs are related to being together (McMillan & Chavis, 1986). "Mutual dependence, sense of belonging, correlativity, spirit, trust, interaction, common expectations, common values and goals, overlapping histories" are terms used to describe the sense of community among group members (Rovai, 2002a). The reduced sense of community in online learning causes learners to feel they do not belong to the community, a feeling of social exclusion that leads to results such as decreased interest in the course, distraction, decrease in motivation and dropping out (Rovai, 2002b). Research has been conducted aimed at raising the sense of online community and on variables that affect or are influenced by the sense of community (Gökçearslan & Alper, 2015) has been conducted.

Creating a feeling of an online learning community for learners is one of the necessary variables for an effective online learning application (Nguyen, 2015). Sun and Chen (2016) indicate the importance of online learning communities in increasing corporate success in online learning. The sense of community refers to the information flow, collaboration, support and commitment to group goals. The factors that lead to participation in online learning communities can be divided into two main categories: external and internal factors. Attitude is one of the internal factors that drive participation in the community (Khalid, 2019). Attitude towards online learning in higher education is an important variable affecting the implementation of education (Mitchell & Geva-May, 2009). Attitude is one of

the internal factors ensuring participation in the community (Khalid, 2019). Students and instructors' attitudes towards learning are strong determinants for the successful implementation and effectiveness of online learning (Wang, MacArthur, & Crosby, 2003). There is a relationship between the sense of a learning community and a positive attitude towards online learning (Chatterjee & Correia, 2020).

Knowledge sharing behaviour as a predictor of online learning attitudes

Knowledge sharing behaviour predominantly works in virtual work teams (Jadin, Gnambs & Batinic, 2013) and is related to the willingness of an individual in a virtual community to share the acquired or produced knowledge with others (Yu, Lu, & Liu, 2010). Knowledge sharing behaviour has a complex structure when evaluated within the scope of knowledge management (Tong, Tak & Wong, 2013). The concepts of information and knowledge are different from each other: when information is processed by individuals, it turns into knowledge. This transformation happens through knowledge management, a procedure that takes place within the scope of behaviours such as collecting, synthesising and disseminating knowledge. The product resulting from this process is delivered to the right person at the right time through knowledge sharing (Kane, Robinson-Combre, Zane & Berge, 2010).

Knowledge can be divided into two categories: explicit and tacit. Explicit knowledge is passed on to others through someone's experiences. Implicit knowledge is based on people's values, experiences, and behaviour (Fattah, Mohamed, Bashir & Al Alawi, 2020). Knowledge sharing behaviour can happen online by organising frequently asked questions (FAQ) or by notifying people directly (Yu, Lu, & Liu, 2010). Therefore, e-learning environments can provide a suitable environment for conveying knowledge in various forms, thanks to their flexibility, collaboration and adaptability to students. This process can be done efficiently when today's dynamic web tools that can provide interaction are used in e-learning environments (Kane, Robinson-Combre, Zane & Berge, 2010). The teaching process is a communication process whose efficiency is related to the rate of communication quality. In online learning environments, communication takes place within the possibilities offered by Information and Communication Technology (ICT). According to Tong, Tak & Wong (2013), knowledge sharing can be facilitated by using appropriate technology and equipment. As pointed out by Eid, & Al-Jabri (2016), chatting, discussion and file sharing variables affect knowledge sharing in virtual environments. Knowledge sharing influences learning performance (Pangil & Chan, 2014).

Attitude is the mental situation in which the individual chooses the behaviour before certain situations occur (Gagne, 1985). Therefore, it is possible to observe the individual's behaviour of the individual to the extent of the strength of the attitude. Knowledge sharing behaviour is an online learning attitude indicator that can present information about online learning attitudes through observation.

Reflective thinking level as a predictor of online learning attitude

Reflection is the process of creating a mental model from the learner's experiences (Saritepeci, 2017). Reflection involves criticising assumptions about the problem-solving process or content. Unlike problem-solving, criticising assumptions is about presenting problems (Başol & Evin-Gencel, 2013). Reflective learning is a process that supports better comprehension of content units with a critical point of view and knowledge transfer (Strampel & Oliver, 2007).

Reflective learning is crucial for the good design and evaluation of distance education programmes, which have acquired a prominent place in the education system during the COVID-19 pandemic. To improve students' distance learning attitudes, reflective learning can create motivation in terms of problem-solving, creating solutions, and sharing what they produce (Saritepeci & Yildiz Durak, 2020). For these reasons, one online learning attitude indicator is the reflective thinking level.

Perceived socialisation as a predictor of online learning attitudes

Face-to-face communication differs in online learning environments. Online lectures may be flexible or inflexible. The freedom given to the students can at some point turn into a feeling of isolation and

discomfort. In this context, online socialisation is more complex than it seems (Irwin & Berge, 2006). According to Salmon (2012), online socialisation plays a key role in learning. Traditional classroom and campus socialisation are missing from the online learning environment (Adnan & Anwar, 2020). Socialness is an approach regarding the individual's environment and refers to their perception of the environment and the group regarding social interaction (Ergün & Usluel, 2015). Berge and Muilenburg (2005) state that social interactions rank second from the top in the list of the eight biggest obstacles to online learning. Social learning environments improve attitudes towards online learning (Raspopovic, Cvetanovic, Medan, & Ljubojevic, 2017).

Method

Research Model

This study uses a mixed-method design to gain a comprehensive understanding of university students' attitudes towards online learning and the factors that influence them during the COVID-19 pandemic. Mixed method combines both qualitative and quantitative data (Creswell, 2012). Explanatory sequential mixed method design was used. Relational survey model was used in the quantitative part of the study and interview was used in the qualitative part. The quantitative component identifies and analyzes predictive variables such as reflective thinking, perceived socialness, knowledge-sharing behavior, and sense of community. Meanwhile, the qualitative component enriches the findings by capturing students' personal experiences, preferences and perceived challenges in distance education. Together, these methods allow for a robust examination of students' attitudes and integrate quantitative data with personal narratives to provide both depth and breadth in understanding the factors shaping online learning attitudes.

Participants

This study was conducted in the autumn semester of the 2020-2021 academic year with the participation of 506 university students. Before the application of the study, the participants were informed about the study and the participants were volunteers. A semi-structured interview was held with each volunteer participant. Of the participants, 82.2% were women and 17.8% were men. The average age was 20.85. Of students from all classes and different departments, including undergraduate (years 1 to 4) and graduate students, 36.8% spent ten hours or more weekly on distance education studies due to COVID-19.

Data collection tools

Personal Information Form: This data collection tool consisting of five items was developed by the researchers to collect personal data from the study group.

Online Learning Attitude Scale: This scale was developed by Usta, Uysal and Okur (2016) to measure university students' attitudes towards online learning. The scale is a five-point Likert scale with 20 items and four factors: General Acceptance, Individual Awareness, Practicality and Practice Effectiveness. The internal consistency coefficients (Cronbach alpha) of the scale were calculated as 0.925.

Reflective Thinking Level Scale: This scale was developed by Kember et al. (2000) and adapted to Turkish by Başol and Evin-Gencel (2013). This scale was developed for university students; it has 16 items and uses a five-point Likert grading scale. The lowest score that can be obtained from the scale is 16 and the highest score is 80. The higher the scores, the higher the student's reflective thinking level. The scale is designed to measure the reflective thinking levels of students at the end of a course in four sub-dimensions: Habit, Comprehension, Reflection and Critical Reflection. The internal consistency coefficients (Cronbach alpha) of the scale were calculated as 0.901.

Knowledge Sharing Behavior in Online Learning Environments Scale: This scale was developed by Tseng and Kuo (2014) and adapted into Turkish by Yücel and Ergün (2015). This scale was developed for university students; it consists of two factors, namely getting information and giving information, and nine items. The internal consistency coefficients (Cronbach alpha) of this seven-point Likert scale were calculated as 0.894.

Perceived Sociability in Online Learning Environments Scale: This scale aims to determine the perceptions of university students studying in online learning environments of the socialness of the learning environment. This scale, developed by Ergün and Usluel (2015), consists of 12 items and two factors. The Cronbach's alpha internal consistency coefficient calculated based on item analysis for the reliability of the scale, which was designed in a five-point Likert style, was 0.936 for both factors.

Sense of Community in Online Learning Scale: This scale was developed by Gökçearslan (2013) to measure the level of perception of individuals participating in the online learning community at the university level as part of the learning community. The scale, which consists of 28 items and three sub-dimensions, has a four-point Likert structure. The Cronbach alpha internal consistency coefficient calculated based on item analysis for the reliability of the scale was found to be 0.962 overall.

Semi-structured interview: The participants were asked four questions regarding their distance education experiences during COVID-19, which were used in this data collection tool developed by the researchers. During its development process, the data collection tool was arranged by taking the opinions of two domain experts to ensure validity and reliability. The questions in the data collection tool are as follows:

What aspects/practices in distance education activities do you like?

What aspects/practices in distance education activities do you not like?

How did the use of synchronous/asynchronous course videos in distance education activities contribute to your learning experiences? Which was more effective?

How did distance education activities change your view of learning experiences?

Data analysis

The Statistical Package for Social Sciences (SPSS) was used to analyse the quantitative data and the NVivo 11 programme was used for the analysis of qualitative data. For the first question, descriptive statistics including means, and standard deviations were calculated to determine students' perceptions of research variables. For the second question, correlation and regression analyses were used to determine students' reflective thinking, perceived sociability, knowledge sharing behaviours and their sense of learning community predictors of online learning attitudes. For the third question, qualitative data were analysed by content analysis. Inductive content analysis was used to examine the views of 506 participants who expressed opinions on distance education during the COVID-19 pandemic. Content analysis was used to analyse the views of 506 university students who expressed their opinions about distance education during the pandemic and to analyse the data. Word clouds were created to visualise the analysis made with content analysis. The basic contents of the data were structured by following the open coding, category creation and abstraction process.

Findings

Descriptive statistics

Descriptive analyses for the first research question of the study are presented in Table 1.

Table 1. Descriptives

Scales	Minimum	Maximum	Mean	Mean/k*	Std. deviation
Online learning attitude	20.00	96.00	54.9466	2.747	16.74181
Reflective thinking level	16.00	80.00	53.2095	3.326	11.09114
Knowledge sharing behavior in online learning environments	9.00	63.00	38.1640	4.240	12.30724
Perceived socialness towards online learning environments	12.00	60.00	33.7787	2.815	11.46490
Sense of community in online learning	14.00	56.00	35.8715	2.562	11.38234

**k: Number of items*

The online attitude scores of the students are 54.9466. Reflective thinking scores are 53.2095, online learning environments scores in knowledge sharing behaviour are 38.1640, perceived socialness scores are 33.7787, and sense of community scores are 35.8715. Considering the number of items and Likert grading of the scales, the level of reflective thinking is higher than the other variables. The variable with the lowest average is the online learning attitude.

Correlations

Correlation analyses for the second research question of the study are presented in Table 2.

Table 2. Correlations

Variable	1	2	3	4	5
1-Online learning attitude	1				
2-Reflective thinking level	0.505**	1			
3-Knowledge sharing behavior in online learning environments	0.431**	0.569**	1		
4-Perceived socialness towards online learning environments	0.666**	0.527**	0.560	1	
5-Sense of community in online learning	0.672**	0.566**	0.503	0.772	1

Correlation is significant at the 0.01 level (2-tailed).**

There are statistically positive and significant correlations between the dependent variable and all independent variables. Online learning attitude shows a statistically significant relationship with reflective thinking levels ($r = 0.505$, $p < 0.01$), knowledge sharing behaviour ($r = 0.431$, $p < 0.01$), perceived socialness ($r = 0.666$, $p < 0.01$), and sense of community. ($r = 0.672$, $p < 0.01$). All

relationships are positive, significant, and medium-level. Online learning attitude shows the highest relationship with a sense of community in online learning.

There are moderately positive relationships between the knowledge sharing behaviour in online learning environments and perceived socialness towards online learning environments (r = 0.560, p> 0.01) and sense of community in online learning (r = 0.503, p> 0.01). There is a high level of positive relationship (r = 0.772, p> 0.01) between the sense of community in online learning and perceived socialness towards online learning environments. However, these three relationships are not significant.

Regression analysis

Regression analyses for the second research question of the study are presented in Table 3.

Table 3. Regression analysis of predictors of online learning attitude

Model	Predictor	Unstandardized B	SE	β	t	p
1	(Constant)	28.671	7.070		4.055	0.000
	Gender	1.061	1.934	0.024	0.548	0.584
	Age	1.215	0.308	0.189	3.943	0.000
	Educational grade	.232	1.690	0.007	0.137	0.891
	R = 0.186, R2 = 0.035, Adjusted R2 = 0.029, F = 5.996, p = 0.001					
2	(Constant)	28.193	7.066		3.990	0.000
	Gender	.874	1.935	0.020	.451	0.652
	Age	1.198	.308	0.186	3.891	0.000
	Educational grade	.492	1.695	0.014	.290	0.772
	Weekly time allocated to distance education studies with COVID 19	2.446	1.534	0.071	1.594	0.111
	R = 0.199, R2 = 0.039, Adjusted R2 = 0.032, F = 5.147, p = 0.000					
3	(Constant)	5.716	5.355		1.067	0.286
	Gender	-0.251	1.370	-0.006	-0.183	0.855
	Age	0.216	0.221	0.034	0.976	0.329
	Educational grade	-2.472	1.202	-0.070	-2.055	0.040
	Weekly time allocated to distance education studies with COVID 19	1.778	1.089	0.051	1.633	0.103
	Reflective Thinking Level	0.217	0.062	0.144	3.512	0.000

Knowledge Sharing Behavior in Online Learning Environments	-0.010	0.055	-0.008	-.184	0.854
Perceived Socialness towards Online Learning Environments	0.489	0.075	0.335	6.498	0.000
Sense of Community in Online Learning	0.486	0.075	0.330	6.509	0.000
R = 0.728, R2 = 0.530, Adjusted R2 = 0.522, F = 70.005, p = 0.000, Durbin-Watson = 2.009					

**Gender Dummy: Female=1 Others=2; Educational grade Dummy: 1st class=1 others=0; Weekly time allocated to distance education studies with COVID-19 Dummy: 10 hours and above= 1 others=0*

A stepwise multiple regression analysis was conducted to examine the predictor effects of students' reflective thinking levels of personal variables (gender, age, class, time spent on distance education during the COVID-19 pandemic), perceived socialness towards online learning environments, knowledge sharing behaviour in online learning environments, and sense of community in online learning. For stepwise multiple regression analysis, the Durbin-Watson statistics are calculated around 2, and this value indicates that there is no independent error (Field, 2013). All of the tolerance statistics are above 0.1. There are no multiple linearities between the independent variables.

In Table 3, the first step examines the predictors of personal variables on online learning attitudes. While establishing the model, gender and class variables including categorical data were taken as dummy variables. This model constitutes 3.5% of the total variance. In the next step, the time spent weekly on distance education during COVID-19 was included in the analysis. This model constitutes 3.9% of the total variance. In the third step, reflective thinking levels, perceived socialness towards online learning environments, knowledge sharing behaviours in online learning environments, and perception of individuals participating in the online learning community as part of the self-learning community were included in the study. This model constitutes 53.0% of the total variance. Based on these findings, Model 3 is of great importance in explaining the online learning attitude.

Learner experiences in distance education

The participants were asked four open-ended questions to evaluate their distance education experiences. This section includes the analysis of these data.

What aspects/practices in distance education activities do you like?

Participants' answers to the question "What aspects/practices in distance education activities do you like?" are presented in Figure 1 in a word cloud. The possibility to repeat the simultaneous courses is the favourite part of distance education. In this context, "replay" was the most frequently expressed student opinion. Participants' views on this issue include: "Having the chance to watch the courses again later" (P06) and "Being able to access the courses that we cannot attend in person because they are recorded or having the chance to watch them again is the best aspect of distance education according to me" (P68). Another frequently expressed opinion related to this view is having the opportunity to “listen again”. Participant 165 said, “We have the opportunity to listen to the lecture again whenever we want. I think this is a very advantageous situation.”

A significant portion of the participants stated that there is "nothing" they like about distance education activities. Some of the participants' views regarding this view are as follows: "I do not find distance education useful and efficient in any way" (P76) and “I did not like any aspect of it. It was not an effective and efficient programme; it was inefficient not only for our school but for all schools.”

One of the favourite aspects of distance education activities is “easier access” to course registration, activities and resources. The participants' views about easier access include: "The courses can be

viewed again, and we can easily access the course documents" (P84), "Being able to access course contents whenever we want" (P98) and “Easier access to teaching materials” (P130). Other favoured aspects of distance education activities in students' opinions are (1) realisation of learning activities at the desired time (what/whenever), (2) easier participation (participation), (3) providing comfort independently of the place and time of the learning-teaching process, transportation, etc. (comfort) (4) and spending less time on activities other than learning-teaching activities (time saved).

Figure 1. *Participant views’ word cloud on popular aspects in distance education*

What aspects/practices in distance education activities do you not like?

Participants' answers to the second question are presented in Figure 2 in a word cloud. Problems with access to the online system provided by the institution for various reasons are the most disliked aspect of distance education. In this context, ‘connection problems’ is the most common opinion in student views. Students' views about this problem include: "Internet connection problems that I experienced during the lesson” (P205) and “The only problem in distance education is the disconnection. When there is disconnection, it annoys me if it happens during the lesson” (P218). A frequently-voiced element is ‘problems experienced in the e-learning environment’; student views on this situation include: “Our school's distance education platform is insufficient. System problems, connection errors, synchronisation errors in the recording of the course, not reaching us of the educational contents uploaded by the lecturer to the system” (P85), “We are constantly experiencing difficulties in the system (in the e-learning environment). Courses are interrupted and therefore not efficient enough” (P240) and "I do not think the servers of the distance education system are very good. Although my internet speed is very good, there are many disconnection cases” (P410).

One of the prominent aspects of distance education students do not like is that student-teacher and student-student interaction remains limited with the simultaneous courses and the simultaneous tools. Participants' views about the lack of interaction include: “Low level of mutual interaction and sometimes not at all” (P449) and “We cannot realise elements such as gestures and facial expressions, come eye to eye which are important elements in communication, sometimes we cannot deliver the message we want to convey to the other party” (P32). In addition to the lack of interaction, the significant increase in workload compared to face-to-face education is another important

disadvantage of distance education activities. Participants' views regarding the increase in the workload with distance education include: “Giving too much homework, doing quizzes and exams, it is as if we have no other jobs, not to consider whether there is a disease we are dealing with, and it bores students” (P175) and “We are exposed to a continuous cycle of homework as if it was easy just because we are studying online” (P187). Other views are (1) ineffectiveness of the courses due to various access, disconnection, etc., (2) the opportunities to learn by practising or learning by doing are limited as a result of the courses being held in a theoretical structure in general, (3) having problems in learning motivation, (4) not being able to participate actively in the lessons, (5) falling behind in concurrent courses, (6) frequent distractions due to the home environment and (7) difficulty in learning compared to face-to-face education.

Figure 2. Participant views’ word cloud on unpopular aspects in distance education

How did the use of synchronous/asynchronous course videos in distance education activities contribute to your learning experiences? Which was more effective?

A common student answer to the question “Which was more effective?” was the opinion that “synchronous courses are more effective” (see Figure 3). Students' opinions about the fact that synchronous courses are more effective include: “Synchronous courses were a little more beneficial because they were live rather than asynchronous courses. In my opinion, the classroom is ideal for a beneficial learning environment. However, synchronous courses were more effective for me because they were live.” (P132). However, comments on the effectiveness of asynchronous courses are frequent. Participant 309 said, “Asynchronous courses are more useful in connection, as there is no problem in sound and visual. We can ask the most questions in synchronous courses, but I think asynchronous courses are more effective because I don't usually ask too much.” Many participants stated that both synchronous and asynchronous courses were insufficient in providing an effective learning experience. Participant 264 said, “It did not make any contribution. On the contrary, it reduced my interest in lessons.”

The most prominent contribution of asynchronous course contents in the context of learning experiences is the ability to watch the recorded courses at any time. Some student views on this issue include: “It is a great blessing in terms of understanding the subjects to watch the recorded courses again and again at any time, and the opportunity to watch the courses I could not attend is a very nice situation. It is nice to be informed about the assignments given in the lessons that we could not attend and the ones participated in the previous week” (P2) and “Live courses pass very fast because there

is a time problem, but in asynchronous lessons, we can watch the videos over and over again. This of course gives us a chance to listen to parts a few times that we do not understand" (P236). Other frequent participant views regarding the contribution of asynchronous course contents to learning experiences include: (1) providing independent learning from time and place and (2) easy access to course contents.

The most frequently expressed opinion about synchronous courses is the value of the opportunity to receive instant feedback from the instructor. The views of the participants on instant feedback in synchronous courses are: "Synchronous course videos are of course much more effective. When there is a part that we wonder about during the lesson, we can get the answer directly. In addition, simultaneous communication with the instructor makes me feel safer and increases my interest in the lesson" (P424) and "I think synchronous course videos always contribute more. It is better to ask if you don't understand and get instant feedback from the instructor than to watch videos afterwards and go around with question marks throughout the week" (P492). Another point that stands out in the contribution of synchronous courses to learning experiences is interaction. Participants' views on the fact that interaction is an important element in synchronous courses include: "Interacting with the instructor and asking questions is an advantage in synchronous courses" (P86) and "I think synchronous courses are more effective because when there is something we do not understand, we can ask questions instantly and get the answer."

Figure 3. Participant views' word cloud on learning experiences in distance education

How did distance education activities change your view of learning experiences?

In this part, the participants' answers to "How did distance education activities change your view of learning experiences?" were examined (see Figure 4). As a reflection of negative experiences in distance education, "the importance of face-to-face education" is the most prominent participant opinion. Student views on understanding the importance of face-to-face education include: "I realised how effective face-to-face education is" (P370) and "We realised that face-to-face education is an important and correct education system. I hope we will start face-to-face education as soon as possible" (P451). Another prominent view regarding negative experiences is that "distance education cannot be provided with effective learning". Other participants' views on this issue include: "Learning

can never be fully achieved with distance education" (P180) and "I realised that nothing was complete in distance education; there was always something unfinished" (P278).

Not all viewpoints were negative. The most prominent positive perspective in the participants' views is the view that learning is possible in different ways. Comments about this situation included: “I think there is a way to meet education in all conditions and the perception of place-time disappears to learn” (P116) and “I used to think that learning would be difficult without a school, and now I realise that learning from home will be easy” (P238). Another view that is frequently expressed is that “effective learning can be achieved with distance education.” Participant 273 said, "I have seen that learning can take place remotely and more comfortably, without getting tired, and economically." Another important point is the change in the students’ perspective regarding taking responsibility for their learning. Participant 147’s opinion on this subject was, “I think the responsibility that falls on me has increased more. It increased the need for further research and investigation on any topic covered in the course.”

Other participant views on learning experiences include 1) theoretical learning is not enough, (2) the importance of hands-on-training, (3) the importance of interaction in learning, (4) the activities require more effort than face-to-face education, (5) distance education has low efficiency in terms of learning, (6) learning by research with distance education is important and (7) flexible learning experiences can be effective.

Figure 4. Participant views’ word cloud on distance education activities change their view of learning experiences

Conclusion, Discussion and Suggestions

The results of this research, which was conducted to determine the predictors of online learning attitudes at the higher education level during the COVID-19 global outbreak, show positive, moderate and significant relationships between online learning attitudes, which is the dependent variable, and the independent variables (reflective thinking, knowledge sharing behaviours, perceived socialness and the sense of community). Student attitudes towards online learning (Mitchell & Geva-May 2009; Wang, MacArthur, & Crosby, 2003), which is one of the important variables in the effective implementation of distance education, showed the highest relationship with the sense of community. Encouraging a sense of community will positively affect the student's attitude towards the course by

reducing the feeling of isolation due to being away (Ludwig-Hardman, & Dunlap, 2003). In the literature, research results confirm this relationship. There is a relationship between the sense of community and a positive attitude towards online learning (Chatterjee & Correia, 2020). In parallel with this study, there are studies (Raspopovic, Cvetanovic, Medan, & Ljubojevic, 2017) that found a relationship between perceived socialness and attitude towards online learning. The reflective thinking variable is a motivation provider for sharing the knowledge produced by students in the learning environment, (Saritepeci & Yildiz Durak, 2020). It positively affects knowledge transfer (Strampel & Oliver, 2007), and showing a positive relationship to online learning attitude is expected. The attitude has a behavioural dimension (Tavşancıl, 2002) and can be observed from the actions of the individual in the context of reflective thinking, as in this study. From this point of view, knowledge sharing behaviour (Yu, Lu, & Liu, 2010), which is about the willingness of students to share the knowledge they have acquired in the online learning environment, is a reflection of the behavioural dimension of the attitude. As a result, it is quite common to have a meaningful relationship with an online learning attitude.

No significant relationships were found between three of the independent variables. There are moderately positive relationships between the variable of knowledge sharing behaviour in online learning environments and perceived socialness towards online learning environments and the sense of online learning community. There is a highly positive relationship between the sense of online learning community and perceived socialness towards online learning environments. However, these three relationships are not significant. In the COVID-19 global outbreak, a mandatory transition was made to distance education (Eken, Tosun & Eken-Tuzcu, 2020). Therefore, the lack of meaningful relationships between these three variables related to communication and interaction suggests that pedagogically necessary precautions could not be taken in distance education that was switched suddenly. In other words, students may not be able to share knowledge systematically and socialise in the context of knowledge sharing in this environment. Therefore, the sense of online learning community variable may not have occurred with socialisation. Studies to be carried out after the COVID-19 global outbreak should consider these three variables again and make comparisons with the results of this study.

Although the effect of sociality in building an online learning community in a university-level online course is mentioned (Balboni, Perrucci, Cacciamani, & Zumbo, 2018), social learning environments improve the attitude towards online learning (Raspopovic, Cvetanovic, Medan, & Ljubojevic, 2017). Learning is not just a process of transferring knowledge; teachers and students learn in social processes, and sociality plays a key role in overcoming negative emotions during the COVID-19 pandemic (Cano & Venutti, 2020).

The model related to personal variables (gender, age, class) constitutes 3.5% of the total variance. In the next step, the time spent weekly on distance education during COVID-19 was included in the analysis. This model constitutes 3.9% of the total variance. Demographics and time spent on distance education lowly explain the attitude towards online learning. In the third step, reflective thinking level, perceived socialness in online learning environments, knowledge sharing behaviours in online learning environments, and perception of individuals participating in the online learning community as part of the self-learning community were included. This model constitutes 53.0% of the total variance. The contribution of independent variables consisting of affective factors to the model is quite high. Based on these findings, Model 3 is of great importance in explaining online learning attitudes. The results of the regression analysis show that the predictor of knowledge sharing behaviour on the feeling of an online learning community was not significant. These two variables increase and decrease mutually, but knowledge sharing behaviour does not directly explain the attitude and behaviour towards online learning. Knowledge sharing behaviour is known to be the most complex discipline (Tong, Tak & Wong, 2013) and its relationship with many variables is revealed in the literature. Some variables that can be categorised as individual, organisational and technological barriers are likely to negatively affect knowledge sharing behaviour (Sohail & Daud, 2009). Sense of spirituality does not affect knowledge sharing behaviour directly (Rahman, Fattah,

Hassan, & Haque, 2020). This result has likely come about because of the initiation of the distance education process due to the COVID-19 pandemic and the students' feeling that they are compulsorily involved in this process. This situation can be associated with a sense of spirituality and can be considered within the context of individual barriers related to knowledge sharing behaviour.

The qualitative part of the study expresses the themes that stand out. A significant portion of the participants stated that there is "nothing" they liked about the distance education activities. The aspects of distance education activities favoured by students are the possibility of repeating, easy access to course materials, what/whenever learning activities are carried out, easier participation in the courses, independence of learning-teaching process from place, time and transportation, and spending less time on activities other than learning-teaching activities.

Frequently expressed participant views regarding aspects of the distance education experience they dislike are internet connection problems and problems in the operation of the learning management systems. Other opinions are that as a result of the courses which consist of a theoretical structure in general, the opportunities for learning by practising or learning by doing are limited, that there are learning motivation problems, that they are not able to participate actively in the courses, that the simultaneous course time is generally insufficient, and that the comfort created by the home environment causes difficulty in learning compared to face-to-face education.

In addition to the widespread positive opinion about the contribution of synchronous course contents to learning experiences, asynchronous courses are viewed positively by some participants. Nevertheless, the number of students who stated that both methods are not sufficient is substantial. Other points mentioned are instant feedback and interaction opportunity are highly favoured in synchronous courses, while in asynchronous courses the ability to repeat the recordings, providing learning independence from time and place, easy access to the course contents and the opportunity to watch recordings over and over.

Student opinions about how distance education activities changed their view of learning experiences emphasised the importance of "face-to-face education" as a reflection of their negative experiences. Another prominent view regarding negative experiences is that "distance education cannot be provided with effective learning." The most prominent positive opinions are that the possibility of learning in different ways, that effective learning can be achieved and that students take responsibility for their learning. Other points mentioned include realising that theoretical learning is not sufficient, the importance of practical education, the importance of interaction in learning, that the activities require more effort than face-to-face education, that distance education has low efficiency in terms of learning, the importance of learning by searching in distance education, and flexible learning experiences.

The data obtained within the scope of this study was obtained from people who had to experience distance education due to the Covid-19 pandemic. While designing this instruction process, rapidly available technological opportunities were put to use and the process was shaped according to traditional pedagogy. The qualitative data also reflect this traditional process and the students liked the opportunities provided by technology and did not like the technological disruptions. They thought that the distance education process carried out in this way was not sufficient for all teaching content and did not like the limited teaching communication. In the literature, it is recommended to provide *student-content*, *student-student* and *student-teacher* interaction in order to make the instructional communication process in the online environment more efficient (Garrison, Anderson & Archer, 1999). In addition, it is emphasized that teaching procedures in this environment should be designed by considering the balance between *instructional dialogue*, *programme structure* and the *autonomy of the learner* (Moore, 1993). It is known that it is not possible for students to share information in this instruction process. As a result, knowledge sharing behaviour, which is one of the variables considered in the context of Predictors of online learning attitude, is not a significant variable.

Limitation, and recommendations

This research is limited to universities that have a Distance Education Application and Research Center (UZEM). It is limited to the distance education experience offered by the universities where the study group is located. During the period of the study, the data were collected from the universities whose distance education infrastructure functions dynamically, where there are seminars for students and lecturers regarding the use of the system and the teaching process, and where continuous support is provided. Universities that do not have UZEM are different because there are distance education experts in universities with UZEM. The research was conducted mainly with undergraduate students but included graduate students. Students' attitudes towards online learning may differ at different sample levels.

COVID-19 has accelerated the mandatory transition to distance education. Some learners have entered higher education without meeting face-to-face. In addition to the possibilities of technology, affective characteristics are effective in the application of distance education. Reflective thinking in online learning, perceived socialness towards online learning environments, behaviour and perception variables including the sense of community in online learning explain at high levels. These variables show a statistically significant relationship. Online learning attitude showed the highest relationship with the sense of community. It is recommended that universities increase their supportive activities to enhance the sense of community. The explanation rate of the variables investigated in the attitude towards online learning is 53%. Including other affective factors and individual characteristics in the model is suggested. Although this study is guided by compulsory conditions such as the pandemic, it should be repeated at a time when students do not feel obliged to online education and its results compared with those of future studies.

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