Investigation of distance education students' experiences on content-integrated social interactions

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Abstract

It is aimed to examine the interaction experiences of distance education students in e-learning environments where content-integrated social interaction opportunities are offered, and in line with this purpose, the factors affecting students' level of interaction, appreciation, and participation in interactions were examined. The study group of the research, which was designed as a multiple case study, consists of 80 undergraduate students studying asynchronous activity-oriented distance education and 31 graduate students studying synchronous activity-oriented distance education in one of the major universities in Turkey. In the research, a social e-learning environment that works integrated with e-learning contents and offers students synchronous and asynchronous interaction options with educators and students at the same time was used. Students were expected to study the contents in this e-learning environment and establish social interactions at the same time. After the application, semi-structured interviews were conducted with the students. Descriptive analysis and content analysis were used in the analysis of the data obtained from the e-learning environment and interviews. In the research, asynchronous activity-oriented distance education students showed a study-oriented approach to the content by being involved in interactions in less time and fewer numbers than other students. Related to this, it was seen that content-based factors were one of the factors that most affected their participation and appreciation. In addition to studying the content, the synchronous activity-oriented distance education students actively used the synchronous interaction panel. Regarding this, the factor that most affected their participation and appreciation was the structural and technical features of the system, in which content-integrated social interactions were presented. In the research, in line with these results, the experiences of the students were evaluated and suggestions were made.

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1 Introduction

Interaction is an important component in learning processes due to its functions such as stimulating-gaining-maintaining attention, informing the student, and providing feedback on performance (Luo et al., 2017; Smith, 2007). Interaction in distance education environments, on the other hand, appears as the relationship that students establish with the course content, other students, educators, and technological tools in the learning environment (Thurmond, 2003), and it is very important in terms of providing communication, cooperation, and active learning (Kenny, 2002; Molinillo et al., 2018; Zhang, 2022). Today, advancements in technology allow very effective and efficient interaction experiences to be offered in distance education environments (Harper, 2018; Zhang & Yu, 2021). Students can interact with each other and with educators in different types regardless of time and place (Garrison & Anderson, 2003; Soomro et al., 2018). When the literature is examined, it is possible to see a wide variety of studies, from classifications for interaction types in online learning processes to the effect of each interaction type on the learning process. In this context, it has been seen that classifications for interaction types are generally related to time (synchronous and asynchronous), purpose (academic, social, collaborative, etc.), the individual or situation interacted with (such as student, educator, content, interface), and the space interacted with (face-to-face, virtual, blended) (Hillman et al., 1994; Moller, 1998; Moore, 1993).

Different interaction opportunities offered to students in distance education environments provide different advantages for students. Synchronous interactions have advantages such as making it easier for students to ask questions to their peers and educators facilitate students to ask questions to their peers and educators (Bober & Denen, 2001; Stein et al., 2007; Yamada, 2009), providing instant feedback (Wang & Newlin, 2001; Kuyath et al., 2013), motivating by meeting their desire to be together and work together (Mercer, 2002; Romiszowski & Mason, 2004; Yamada 2009). Therefore, it can be said that different interactions presented synchronously and asynchronously can eliminate the feeling of isolation that distance education students have, as well as academic achievements (Zhang, 2022). Because distance education students often feel isolated from other students and educators because they are temporally and spatially distant (Ford, 2021; Kiltz et al., 2020). For this reason, they may need to interact with educators and other students for social purposes as well as academic interactions (McInnerney & Roberts, 2004; Kara et al., 2019).

Social interaction in distance education is the interaction that encourages interpersonal interactions as well as the academic interactions established between student-student and student-educator, thus strengthening social integration in distance education environments (Jung et al., 2002; Samuels-Peretz, 2014). In order to eliminate the effect of physical separation in distance education environments, there is a need for environments where social interaction can be established between students and educators (Daugherty & Funke, 1998). Therefore, the feeling of a learning community will be improved by removing the barrier of interaction, which is one of the reasons for distance education students dropping out of school (Glazer et al., 2013; Purarjomandlangrudi & Chen, 2020). In relation to these reasons, the constructivist learning approach has become increasingly widespread today (Fung, 2004).

Developments in technology allow this approach to be reflected in distance education environments, so that distance education environments can be created in accordance with the social constructivism-oriented learning approach based on the constructivist learning approach (Soomro et al., 2018).

In distance education environments, attention should be paid to collaborative activities and the creation of participatory learning communities for the social construction of knowledge (Schifter & Simon, 1992). In the literature, it is emphasized that very positive results are obtained by providing and effectively applying social interactions that students can establish among themselves and with educators in distance education environments. In such distance education environments, students can gain advantages such as feeling autonomous (Andrade & Bunker, 2009; Fotiadou et al., 2017), developing the processes of structuring and synthesizing knowledge (Hong et al., 2001), developing critical thinking skills (Jong et al., 2013; Vlachopoulos & Makri, 2019), reducing the feeling of loneliness (Van Den Berg, 2020) and dropping out of school (Kara et al., 2019; McInnerney & Roberts, 2004; Purarjomandlangrudi & Chen, 2020). However, it is seen that the interactions offered to students in distance education environments are more formal and limited compared to the social interactions they can establish in non-instructional online learning environments.

When the platforms used to establish social interaction in distance education environments are examined, it is seen that synchronous and asynchronous interaction platforms are generally used. In this context, live lessons and instant messaging systems, where teachers and students are online at the same time, are widely used as a synchronous social interaction platform (Aşkar, 2003; Frambaugh-Kritzer & Stolle, 2019; Raes et al., 2020). Instant interaction between students and teachers is established through specially developed virtual classroom software such as Adobe Connect, Perculus, and Big Blue Button, and social experiences such as question-answer activities and discussions can be offered to students (Elitaş, 2017; İzmirli & Akyüz 2017). This situation increases students' sense of social presence and makes them willing to learn (Aoki, 2012; Asoodar et al., 2014; Raes et al., 2020). On the other hand, forums, blogs, wikis, and e-mail applications are widely used to provide asynchronous social interaction (Aydemir, 2018; Huang & Hsiao, 2012; Kim, 2008). With these applications, which are generally offered through different Learning Management Systems (LMS) such as Moodle, Blackboard, and ALMS, asynchronous interaction opportunities are offered to students, and social experiences such as question-answer activities and discussion can be provided similar to synchronous interaction processes (Huang & Hsiao, 2012).

Studies carried out to examine different types of social interaction processes in distance education environments were examined in terms of platforms used and application processes followed. It was observed that in the majority of the studies examined, applications were made to use discussion platforms that offer asynchronous interaction (Alzahrani, 2017; Cho & Tobias, 2016; Fung, 2004; Halabi & Larkins, 2016; Heo et al., 2010; Jung et al., 2002; McKenna et al., 2019; Pham et al., 2014). It was observed that these applications were carried out on a different platform independent of the screen/platform on which the content is presented, but through discussion platforms integrated into LMSs or independent discussion platforms to address certain content-related topics. In these studies, which were mainly carried out

in a quantitative/quasi-experimental design (Alzahrani, 2017; Cho & Tobias, 2016; Kuyath et al., 2013), different interaction applications were made on different groups and their effects on certain variables were examined. For example, in one study, the research design was made in an online lesson without using a discussion forum in one of the groups, using a discussion forum without educator participation in another, and using a discussion forum with educator participation in another group (Cho & Tobias, 2016). It was found that mixed research designs (Heo et al., 2010; McKenna et al., 2019, Pham et al., 2014) were also frequently preferred, but qualitative studies with in-depth investigations (Fung, 2004) were limited. On the other hand, studies focusing on synchronous interactions, especially through the use of instant messaging systems or live lesson platforms, were found to be quite limited (Kılıç et al., 2016; Kuyath et al., 2013). In these studies, it is seen that the synchronous interactions offered to the students are limited to the question-answer activities developed during the lectures and especially between the student and the educator.

When the studies carried out to examine the social interaction processes in distance education environments are evaluated in terms of the variables examined and the results obtained; it was seen that different variables such as academic achievement (Alzahrani, 2017; Cho & Tobias, 2016; Halabi & Larkins, 2016; Jung et al., 2002; Kuyath et al., 2013), satisfaction (Cho & Tobias, 2016; Jung et al., 2002; Kuyath et al., 2013), sense of community (McKenna et al., 2019), instructional, social and cognitive presence (Cho & Tobias, 2016; Kılıç et al., 2016; Kuyath et al., 2013), participation in the learning process (Jung et al., 2002) were discussed. When the results obtained from the studies are evaluated in general; It was observed that most of the studies on the effect of different interaction alternatives on academic achievement had positive results (Alzahrani, 2017; Halabi & Larkins, 2016; Jung et al., 2002; Kuyath et al., 2013), while some did not have any effect (Cho & Tobias, 2016). It was seen that social interaction with educators through discussion platforms had a positive effect on achievement, and collaborative interactions with peers had a positive effect on satisfaction (Jung et al., 2002). In addition, while the presence of educators in social interaction environments offered through discussion platforms had a positive effect on the sense of social presence, it was observed that it did not affect the level of satisfaction with the lesson (Cho & Tobias, 2016). It was revealed that there was a positive and significant relationship between interaction and creating a sense of community in discussion activities, when prompt feedback, clear expression of expectations, encouragement of participation, educator guidance, and attention to the tone of interaction were observed (McKenna et al., 2019). In the study examining the instant messaging option between students and educators in distance education lessons, it was found that the instant messaging option did not affect satisfaction, but the social presence and academic achievement were higher (Kuyath et al., 2013).

In summary, in asynchronous interaction platforms, social interactions are usually offered to students in a context-independent manner. In other words, in such platforms, the social interaction needs of students based on e-learning material or related to different subjects are provided through a different physical structure/page/environment. Therefore, it requires students to use more than one independent platform if they need social interaction in their study process. When the current applications of social interactions in asynchronous environments are examined, it is seen that the

activities defined under separate names are carried out independently of the materials used in the course. For example; After watching or reviewing a lecture video or lecture notes, discussion activities are started on a separate screen for students. These activities start, continue, and end within a certain time period. In such applications, since the interaction is not integrated with the content of the course, a disconnection occurs both in the first participation in the activity and the research process. Considering the current use of synchronous social interactions, lectures are usually carried out in live lessons, and it is seen that they can be carried out depending on the preference of the instructor in the remaining time from the educator-student interactions. Another limitation is that all interactions must be completed within one lesson. This research was designed and conducted to eliminate such social interaction limitations.

Within the scope of this research, students' social interaction experiences were examined through activities based on conversations and discussions that were integrated with the course content. In this context, synchronous and asynchronous interaction options were presented to the students on the same screen in an integrated manner with the e-learning content, unlike the interaction options offered with traditional Learning Management Systems (LMS) and which are usually on screens independent of e-learning content. Thus, students did not need to use more than one independent platform if they needed social interaction during their study process. Today, it is known that some courses offered on Massive Open Online Course - MOOC platforms such as Udemy include chat or discussion panels on the same page, especially with video-based content. However, in the interaction options on these platforms, it is seen that the integrated structure with the content is structured by establishing a relationship with the whole content, not with different parts of the content. In the e-learning environment used in this research, each of the synchronous and asynchronous interaction options has an integrated structure associated with each section in the content. Thus, students studying the relevant content at the same time can come together and interact freely about any part of the content without being bound by any structured activity or orientation. In this context, the present study aims to examine the experiences of distance education students toward content-integrated social interactions. For this purpose, answers to the following research questions were sought:

1. What is the level of interaction of students in content-integrated social interactions?
2. What are the factors affecting students' participation in and appreciation for content-integrated social interactions in terms of:

   a. System-related factors;
   b. Content-related factors; and
   c. Individual factors?

2 Method

2.1 Research method

The "Multiple Case Study" method, one of the qualitative research methods, was used in this research, which was conducted to examine the experiences of distance education students regarding content-integrated social interactions. Multiple case study is a method used in situations where multiple research environments, samples, or different programs in a single research environment need to be covered in depth. The main purpose of this method is to understand and explain the relevant subject from different perspectives with rich data sources (Creswell, 2007; Creswell, 2016; Merriam, 1998; Yin, 2003). In this research, the multiple case study method was preferred because it requires in-depth research to determine the interaction levels of two study groups, who receive distance education in different models, on a content-integrated social interaction supported platform, and the factors affecting their appreciation and participation in terms of the intensity of synchronous or asynchronous implementation of learning activities.

2.2 Study group

There are two different study groups in this research. For the first case in the research, the study group consists of 80 undergraduate students studying asynchronous activities in one of the major universities in Turkey, and for the second case, 31 graduate students who study distance education based on synchronous activities. Detailed information about the study groups is given below.

2.2.1 Study group 1 (*Asynchronous activity-oriented distance education*)

The students in this study group were selected with the purposive sampling method, which is a sampling method based on the selection and in-depth research of information-rich situations depending on the purpose of the research (Büyüköztürk et al., 2008). While making purposeful sampling, attention was paid to the fact that the students to be included in the study group receive asynchronous activity-oriented distance education and take the course related to the content presented in the content-integrated social interaction system. In this context, 1233 students from among the students of the Open Education Faculty of one of the major universities in Turkey were invited to participate in the research. These selected students followed their lessons asynchronous activity-oriented with weekly reading texts and lesson videos provided through a Learning Management System (LMS) and took the lesson on the existing content in the social interaction system integrated with the content to be used in the research. 218 of these students participated voluntarily. Among these students, 80 students who studied any of the weekly content presented within the scope of the research for at least 5 min were considered as the study group. The reason for using this criterion is that students have spent enough time in the system to gain content-integrated social interaction experience. 16 of the students were male and 64 of them were female. Students in this group were named (Async).

2.2.2　Study group 2 (*Synchronous activity-oriented distance education*)

The purposive sampling method was used while selecting the students in this study group. While making the purposeful sampling, attention was paid to the fact that the students who will be included in the study group perform their distance education activities asynchronous activity-oriented as well as synchronous activity-oriented. In this context, 60 graduate students studying at one of the major universities in Turkey were invited to participate in the research. These students followed a distance-learning course with weekly 3-hour synchronous activity-oriented live lesson sessions, as well as asynchronous activity-oriented materials (lesson presentations and reading texts), discussion forums, and assignments provided to them via LMS. 36 of these students participated voluntarily. Among these students, 31 students who studied any course content for at least 5 min were considered as the study group of the research. The reason for using this criterion is that students have spent enough time in the system to gain content-integrated social interaction experience. 13 of the students were male and 18 of them were female. 24 of these students studying in different programs were master's students and 7 were doctoral students. Students in this group were named (Sync).

2.3　Research Environment

Within the scope of the research, a social e-learning environment called Content Integrated Social Interaction System (CISIS), which was developed within the scope of the doctoral thesis conducted by Bayrak Karsli (2020) was used. CISIS has five key features: interoperability, content integration, synchronous interaction, asynchronous interaction, and data logging. In Fig. 1, a sample screenshot from CISIS is presented and explanations about its key features are given.

- **Interoperability**: CISIS contents can be added to the LMS system where students are registered as an e-Course activity and study within the system.
- **Integration with content**: It works integrated with the course content of the Sharable Content Object Reference Model (SCORM) package type. The system is visually integrated and at the same time, each message written in the chat panel is associated with the content section of the student at the time the message is

Fig. 1 Content Integrated Social Interaction System (CISIS)

written, and each message written in the discussion panel is associated with the content section where the student is at that moment.

- **Synchronous interaction (A)**: A chat panel is available to offer synchronous interaction. The active participant list, who wrote the messages, date-time, and information on where the message was written are presented. Files can be uploaded to the chat area, ready-made template expressions can be added and messages can be deleted.
- **Asynchronous interaction (B)**: A discussion panel is available to offer asynchronous interaction. In the messaging section of the discussion panel, there are features such as content location information, user information, date-time of the message, message content, rating the message, replying/quoting the message, deleting the message, and displaying the replies to the message.
- **Data logging**: In CISIS, user data is associated with the content and recorded in the database and can be reported when necessary.

CISIS, whose features are mentioned above, does not seem different from individual e-learning material when evaluated in general in terms of its structure and use. As seen in Fig. 1, the content panel on the left of the screen constitutes the traditional content presentation area. The "Panel" on the right side of the screen is a "Social Interaction Panel" where students can exchange views among themselves or with educators regarding concepts, exercises, examples, etc. in the content section. Students can chat from the synchronous interaction panel (A), which is integrated with the content in this section (the structure associated with the current topic). In addition, from the asynchronous discussion panel (B), which is integrated with the content (structure associated with the current topic), they can both participate in the previous discussions on the topic they are in and start new discussions. In this context, the steps to be followed by the students who will use the system are as follows:

1. Accessing content that offers content-integrated social interactions through the LMS environment.
2. Studying concepts, exercises, examples, etc. in the content panel.
3. Involving in synchronous conversations integrated with the content on each page (if needed).
4. Participating in asynchronous discussion activities integrated with the content on each page or starting a new discussion activity (if needed).

2.4 Data collection tools

The data collection tools used in the research are given in Table 1 in relation to the research questions.

Content-integrated social interaction logs The logs recorded in the system for content-integrated social interactions were used to determine the time students spent in the system, and the type and number of interactions (synchronous, asynchronous).

Research Questions	Data Collection Tools
Table 1 The Relationship of Data Collection Tools with Research Questions	
1. What is the level of interaction of students in content-integrated social interactions?	- Content-integrated social interaction logs
2. What are the factors affecting students' participation in and appreciation for content-integrated social interactions in terms of: a. System-related factors; b. Content-related factors; and c. Individual factors?	- Semi-structured interview form - Content-integrated social interaction logs

Semi-structured interview form A semi-structured interview form was used to examine the system, content, and individual factors that affect students' participation in and appreciation for content-integrated social interactions. While preparing the interview questions, first of all, the social interaction log records of each student to be interviewed were examined. In this context, the student was given brief information about their experiences in the system before the questions were administered. Then, they were asked to interpret these experiences according to the questions asked to them. An example question structure is presented below.

Question 1: In social interaction processes integrated with the content, we see that you studied …. course content for …. minutes, and you sent …. chat messages and …. forum messages. What do you think about this experience?

Question 2: What are the features that affect your participation and appreciation in social interactions integrated with the content? (Content features, system features, individual features, other)?

The interview form was applied for each case study by following the steps given below.

Case 1 (Asynchronous activity-oriented distance education) During the 12-week practice, 2 of which were pilots, the students were interviewed three times at intervals of four weeks. Social interaction log records integrated with the content were analyzed before each interview, and 3 students who used the system the most, moderately, and least on a time basis were selected as interviewers.

Case 2 (Synchronous activity-oriented distance education) At the end of the application process, which lasted for 6 weeks, 2 of which were pilots, the students were interviewed. Content-integrated social interaction logs were analyzed, and among the students who participated most in the applications, 14 students who interacted most (5 students), moderately (4 students), and least (5 students) with the system according to the frequency of social interaction in the system.

## 2.5 Application and data collection process

The application process of the research was carried out separately for two study groups, which were considered different cases. In this context, the preliminary prepa-

ration, the application process, and the work done after the application are presented and explained in Fig. 2.

2.5.1 Case 1 (asynchronous activity-oriented distance education)

The application, which was carried out with asynchronous activity-oriented distance education students, lasted for a total of 12 weeks, 2 weeks of which was a pilot application, and the system was constantly followed by the researcher for academic and technical support. During the preliminary preparation process, technical preparations for the system, in which content-integrated interactions are presented, were completed and information was provided through user guides, announcement texts, and SMSs. The first 2 weeks of the application were evaluated as a pilot application, and the problems encountered were resolved. In the main application process, which lasted 10 weeks; after 2 weeks of application, usage logs were taken from the system database and analyzed. Based on the analyses, interviews were conducted with 9 students who used the system the most, moderately, and the least. Since the number of social interactions students established in the system was low, the time they spent in the system was taken into account. This process was repeated by following the same steps in the 6th and 10th weeks. After the application, the data was analyzed and the results were interpreted.

Fig. 2 Application and Data Collection Process
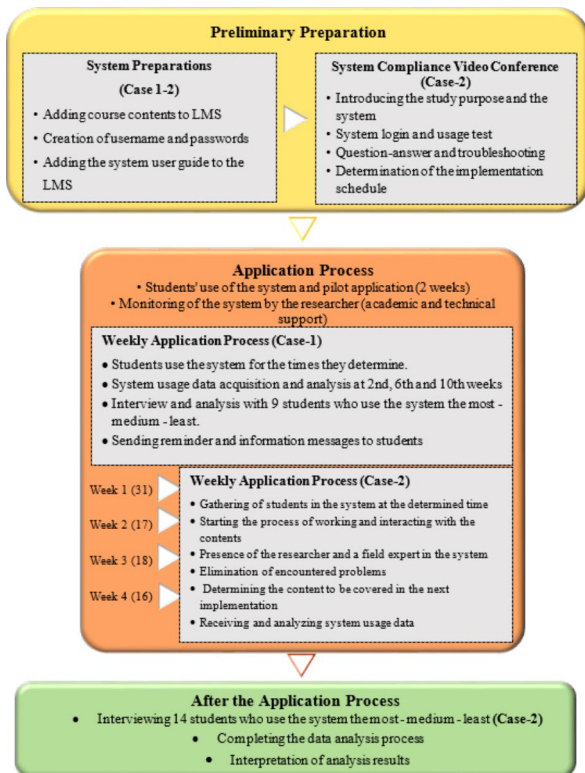
2.5.2 Case 2 (synchronous activity-oriented distance education)

The application, which was carried out with the synchronous activity-oriented distance education students, lasted for a total of 6 weeks, 2 weeks of which was a pilot application. During the preliminary preparation process, technical preparations for the system were completed and information was provided through user manuals, announcement texts, and SMSs. In addition, a video conference was held to adapt to the system, the purpose of the application was explained to the students and they were asked to test the system, and the problems encountered were solved. It was decided to organize synchronous sessions by planning the application process with the volunteer students. In this way, it was ensured that a high number of students were on the same content at the same time in the system, enabling them to experience the interaction offered by the system. However, although the number of students was high in the application with asynchronous activity-oriented distance education students, the low number of participants in the system at the same time negatively affected the interaction among students.

During the application process, the students gathered in the content-integrated social interaction system at the designated time. During the application process, the system was followed by the researcher for academic and technical support, both in synchronous applications and outside the synchronous application process in case of the students' use of the system in different time periods. During the practice hours, the students studied the contents and interacted with each other and with the researcher and a field expert who were in the system as educators. The application process was continued in the same structure for 4 weeks. After the application, in line with the analysis based on the data recorded in the system database, interviews were conducted with 14 students who used the system the most, moderately, and the least. While evaluating the system usage levels of the students, the number of interactions established in the system as well as the time spent in the system were also taken into consideration. The interviews conducted via phone lasted 24–40 min.

2.6 Data analysis

Data analysis was carried out considering the relationship between data collection tools and research questions. Data obtained from log records and interviews for content-integrated social interactions were first transferred to electronic documents. Descriptive analysis methods were used when analyzing the quantitative data obtained from log records for content-integrated social interactions. The content analysis method was used in the analysis of the data obtained through the semi-structured interview form.

The content analysis process of the qualitative data-oriented research was carried out using the NVivo 12 software. The main purpose of content analysis is to combine the collected data within the framework of concepts or themes that can explain for specific purposes (Yıldırım & Şimşek, 2008). In this context, the analysis of qualitative data was carried out by two researchers in three main stages. In the first stage, the data were compiled and arranged and conceptually coded by two researchers in line with the research questions separately. Cohen's cappa ($k = 0.85$) was calculated

to determine the degree of consistency between coders and it was found to be at an acceptable level (Cohen, 1960). After all, the data were coded, a code list was created and it was confirmed whether each data was related to the relevant code. In this process, member checking regarding the coding was provided by contacting the students who were interviewed. In the next stage, codes with common features were gathered under certain themes based on all the codings made. Finally, each theme and the codes in the theme were described and explained in detail and presented in tables based on frequency. In addition, student statements related to each code were given with direct quotations.

3 Findings

3.1 Interaction level of students in content-integrated social interactions

In order to determine the interaction level of students in content-integrated social interactions, the time they spent in the system and the frequency of interaction were examined. The collected data were analyzed descriptively and presented in Table 2.

In Table 2, it is seen that the average time spent by the asynchronous activity-oriented distance education students during the 10-week application in the content-integrated social interaction system on a week-based basis is 48 min, and they interacted with a total of 8 messages, 7 chat messages, and 1 forum message. On the other hand, it is seen that synchronous activity-oriented distance education students spent an average of 78 min in the system during the 4-week application and interacted with a total of 503 messages, including 465 chats and 38 forum messages.

3.2 Factors affecting participation and appreciation in content-integrated social interactions

In order to determine the factors affecting the participation and appreciation of the students in content-integrated social interactions, the content analysis of the interview data with the students was conducted, and the results of the analysis were presented under the titles; system-based, content-based, and individual factors.

Table 2 Interaction Level of Students in Content-Integrated Social Interactions

Case	N	Number of Weeks	Time Spent in the System	Chat Messages	Forum Posts	Total Messages
Asynchronous activity-oriented distance education	80	10	48′	7	1	8
Synchronous activity-oriented distance education	31	4	78′	465	38	503

3.2.1 System-based factors affecting participation and appreciation in content-integrated social interactions

The results of the system-based factors affecting the participation and appreciation of students in social interactions integrated with the content are presented in Table 3.

In Table 3, it is seen that the system-based factors affecting participation and appreciation in content-integrated social interactions are related to the structural features, technical features, and introduction of the system. Some of these factors affect participation and appreciation positively and some negatively. Explanations about these factors are given below and sample statements of the students about the relevant dimensions are given.

When the factors related to the structural features of the system are examined, it is seen that the presence of the educator in the system is considered a strong fac-

Table 3 System-Based Factors Affecting Participation and Appreciation in Content-Integrated Social Interactions

Feature Type	Effect Type	Feature	Frequency	
			Async.	Sync.
Structural Features of the System	Positive	Presence of the educator in the system	3	13
		Presence of other students in the system	10	6
		Synchronous interaction opportunity	-	12
		Asynchronous interaction opportunity	-	9
		Being a unique learning system	1	5
		Supporting different learning styles	-	2
		Providing a safe learning environment	1	1
		Total	**63**	
	Negative	Distraction	-	7
		Limited participation	4	1
		Difficulty in system control	-	3
		Presence of the educator in the system	-	2
		Hosting class members with different characteristics	-	2
		Total	**19**	
Technical Features of the System	Positive	Ability to take advantage of pre-written messages	-	5
		Show the location where the message was written	-	4
		Structure of the chat section	-	3
		Structure of the discussion section	-	2
		Easy to use	2	-
		Adding a ready template expression		1
		File sharing	1	-
		Total	**18**	
	Negative	Content and social interaction panel does not fit on the screen	-	6
		Disappearance of social interaction panel on system re-logins	-	5
		Difficulty viewing the discussion section	-	4
		Total	**15**	
Introduction of the System	Negative	Insufficient information and introduction	7	-
		Total	**7**	

tor that positively affects participation and appreciation by the students who receive synchronous activity-oriented education, and the presence of other students in the system by the students who receive asynchronous activity-oriented education. It is seen that the risk of distraction from the purpose of the education by the system is considered a strong factor that negatively affects participation and appreciation by the students who study with synchronous activity-oriented, and the limited number of participation in the system by the students who study with asynchronous activity-oriented education.

> *"Since I am an open education student, there are a lot of question marks as to how I should do or study any subject. You can't find anyone to ask. That's why you use platforms like Facebook and consult your friends from the previous period. … It is very important to communicate with people who take the same course as us."* (Async-2).
>
> *"I find the opportunity to enter the system late at night. I can't write anything because there is no one to talk to."* (Async −5).
>
> *"The student can learn by himself, but in the environment where the educator is present, the education will be of better quality and more effective. Therefore, it is a very good feature to have an educator present in this system."* (Sync-3).
>
> *"After all, people work individually or in an interactive environment, but when we need to ask our friends or educators something, it is very nice to find such a system that instantly provides us with this opportunity."* (Sync −8).
>
> *"It is a really good learning experience to follow the lesson together, to listen to the lesson while others listen to the lesson, to focus on the same thing at the same time, to support each other."* (Sync −23).

It is seen that the technical features of the system were evaluated especially by the students who studied with synchronous activities, and the ability to make use of what is written in the system before and the location/title of the message in the content are considered as strong factors that positively affected participation and appreciation. It has been determined that technical problems that can be experienced in the system, such as the content and social interaction panel not fitting on the screen, were considered negative factors.

> *"A few friends shared something yesterday, for example, although I didn't write it myself, I definitely learned something by reading what they wrote. … It is very nice that our friends share the things that we do not think of or that we do not share and that we benefit from it."* (Sync −5).
>
> *"In the chat section, when everyone wrote a question, we could see what topic they were on and everyone's progress. We could also easily understand what they were talking about. This feature fixed the confusion that may occur in the chat section."* (Sync −21).
>
> *"The system is nice, but I actually had a hard time listening to the lecture. I guess I can't concentrate while listening to the lecture. I can't adapt while something is written on the side panel. I involuntarily look at what they wrote and said. And this distracts me."* (Sync −21).

"I could not view the lecture and chat panel at the same time. I had to use the screen scroll bars. Therefore, I either looked at the lecture or scrolled the bar and read what was written." (Sync −4).

The lack of adequate information and introduction regarding the system was also considered as a negative factor by the students who studied asynchronously.

"This system should appear on the login screen for students. Otherwise, it may not get attention. Students may not be aware. Being informed is very important in distance education." (Async −4).
"I did not know the intended use of this system. That's why I didn't use it. We need to be seriously informed about the changes." (Async −6).

When the system-based factors that affect the participation and appreciation of the asynchronous activity-oriented distance education students in content-integrated social interactions are evaluated in general, it is seen that the structural features and some technical features of the system mostly affect the participation and appreciation of the students positively. However, it has been revealed that the limited participation in the system and the inadequacy of the system introduction negatively affected the participation and appreciation of the students. On the other hand, it has been seen that the advantages offered by the content-integrated structure, such as the ability to make use of what was previously written in the system and the position of the page title related to the content in which the message was written, positively affect the participation and appreciation of the synchronous activity-oriented distance education students. On the other hand, it is seen that technical problems that may be related to the browser settings used by the students, such as the content and social interaction panel not fitting on the same screen, the disappearance of the social interaction panel when re-logging the system, are considered as features that negatively affect participation and appreciation.

3.2.2 Content-based factors that affect participation and appreciation in content-integrated social interactions

The results for the content-related factors affecting participation and appreciation of the students in the social interactions integrated with the content are presented in Table 4. "Upward green arrow" was used for factors that had a positive effect on participation and appreciation, and "downward red arrow" was used for factors to express that it affected negatively.

In Table 4., it is seen that the content-based factors affecting participation and appreciation in content-integrated social interactions are related to the design and scope of the content. It has been observed that these factors positively affect the appreciation for content-integrated social interactions, but have a negative effect on participation. Explanations about the dimensions and examples of students' statements about the relevant dimensions are given below.

When the factors related to the design of the content are examined, it is seen that the fact that the content is memorable/clear and understandable and that it is struc-

Table 4 Content-Based Factors that Affect Participation and Appreciation in Content-Integrated Social Interactions

Dimension	Factor	Effect on Appreciation	Effect on Participation	Frequency Async	Sync
Content Design	Memorable / Clear and understandable	⬆	⬇	16	9
	Multimedia support	⬆	⬇	10	10
	Total			**45**	
Scope of Content	Not containing unnecessary content	⬆	⬇	8	6
	Adequate coverage of the content	⬆	⬇	4	10
	Total			**28**	

tured with multimedia support is considered as a factor that positively affects the appreciation for content-integrated social interactions by both student groups. However, this situation reflected negatively on students' participation in interaction. The fact that students can generally meet their learning needs from the content indirectly limited their participation in the interaction.

> *"The materials are like a summarized version of the units. We need this type of material because we are not very familiar with what we read. … There were many units that I opened to read but did not understand and closed. However, we didn't need to ask any questions."* (Async − 1).
> *"We can visually encode the scenes in our minds and they come to mind in the exam. For example, in a question in the last exam, a picture of a table in the content came to my mind. So I solved the question. That's why I like the content so much."* (Async − 3).
> *"The content was very good. It was remarkable because it was live, both with audio and video. We didn't have to ask too many questions."* (Sync − 5).
> *"Significant parts were highlighted and visualized. The fact that the subject was so understandable made me not need to ask anything extra."* (Sync − 23).
> *"I found the content very satisfying. There were no unnecessary details. It was a structure that we could handle on our own."* (Sync − 19).

When the factors related to the scope of the content are examined, it has been determined that not containing unnecessary content and adequate coverage of the content are considered by both student groups as factors that positively affect the appreciation for content-integrated social interactions. However, the fact that the content met the general expectations of the students indirectly affected their participation in the interaction negatively.

"Since I am a working person, it is a great advantage for me that the course content is more like a summary." (Async − 9).

"Since the materials cover the whole subject, I can study and handle it by myself. " (Async − 7).

"The materials are very well structured. So I don't think there's any need to ask questions." (Async − 14).

"If I don't understand or don't know something, I review it again. I am progressing by learning the right information. I really like these features. They were similar to EBA contents. We were able to manage the content very easily." (Sync-4).

When the content-based factors are evaluated in general; In both study groups, it has been revealed that the fact that the content was presented clearly and understandably, the multimedia elements were included in the design, the content had enough coverage of the subject, and the fact that it did not cause confusion by not containing unnecessary details positively affected the level of appreciation of the students, while it indirectly affected the students negatively in terms of participation in the interaction.

3.2.3 Individual factors affecting participation and appreciation in content-integrated social interactions

The results for individual factors affecting students' participation and appreciation in content-integrated social interactions are presented in Table 5. "Upward green arrow" to express that each factor positively affects participation and appreciation, "downward red arrow" to express that it affects negatively, and "grey dash" was used to show that it does not have any positive or negative effect.

When Table 5 is examined, it is seen that individual factors affecting participation and appreciation in content-integrated social interactions are related to individual approaches to content, learning habits, individual opportunities, and personality traits. Almost all of these factors negatively affect participation and appreciation. Explanations about the dimensions are given below and examples of students' statements about the relevant dimensions are given.

When content approaches are examined, it is seen that the effect of understanding / mastering the subject on the content-integrated social interactions is positive and the effect on the participation status is variable in both study groups. The fact that students understand the subject easily has prepared an environment for some students not to ask questions and interact. However, it also helped some students to be more involved in interactions by making them feel confident. The factors of not being able to produce ideas about the subject and not being interested in the subject were also described as factors that negatively affected the participation of the students in the interaction, especially by the synchronous activity-oriented distance education students.

"There was no question mark in my mind. The materials were very clear and precise. I didn't need to ask any questions because I understood." (Async − 5).

Table 5 Individual Factors Affecting Participation and Appreciation in Content-Integrated Social Interactions

Dimension	Factor	Impact on Appreciation	Impact on Participation	Frequency Async	Frequency Sync
Content Approach	Understanding the subject	↑	↑↓	10	9
	Inability to generate ideas on the subject	▬	↓	-	6
	Lack of interest in the subject	↓	↓	-	2
	Total			**27**	
Individual Opportunities	Lack of time	↓	↓	11	-
	Technical limitations	↓	↓	4	-
	Health problems	↓	↓	1	-
	Total			**16**	
Learning Habits	Making use of pre-written messages	↑	↓	-	5
	Focusing on content	▬	↓	-	3
	Individual learning disposition	↓	↓	-	2
	Studying in specific time periods	↓	↓	2	1
	Preferring comprehensive materials	↓	↓	2	1
	Total			**14**	
Personality Traits	Having a shy nature	↓	↓	-	5
	Distractibility	↓	↓	-	2
	Dislike of online interaction	↓	↓	-	1
	Total			**8**	

"The reason why I did not participate in the conversations too much is related to the fact that I understood the lesson very well. There were not many topics to discuss because the materials were very clear and precise." (Sync − 23).

"Since I had taken this course before, I was quite familiar with the subject. But especially I tried to answer the questions of other friends." (Sync − 19).

"To communicate, I need to have a lot of interests and ideas, but then a question mark arises in my mind and I communicate." (Sync − 6).

When the effect of individual opportunities on appreciation and participation is examined, it is seen that especially asynchronous activity-oriented distance education students describe time inadequacy and technical opportunity constraints as negative factors.

"I couldn't use the interactive features because my time was limited. I have a baby and the sooner I learn, the better for me." (Async − 9).

"The system is nice, but I rarely use it because I don't have an internet connection." (Async − 2).

"Because I wear glasses, I got summarized notes from a friend. There are places that sell notes. I don't study much from the computer anymore." (Async − 11).

When the effect of learning habits of synchronous activity-oriented distance education students on content-integrated social interactions is examined, it is seen that benefiting from the existing correspondence in the system, focusing on the content by ignoring the interaction system and being inclined to individual learning negatively affected participation in the interaction. On the other hand, it has been observed that different learning habits of asynchronous activity-oriented distance education students, such as studying for certain courses in a time period they determine during the term, and generally preferring more comprehensive materials (units/reading texts provided by their faculties) while studying a course, negatively affected appreciation and participation.

> *"When I entered the system, some friends had already spent time in the system. For this reason, I could read previously written messages on the subject that I did not understand. So there was no need for me to write again. (Sync − 22)*
> *"I learn more individually, I have an introverted intelligence. I'm learning on my own without interacting too much with people. Therefore, I was only working on the material in the system. (Sync − 6)*
> *"I will study this course last. Therefore, I may not be able to study at the same time as everyone. I work within my schedule. (Async − 11)*
> *"I think PDF materials are sufficient. Because there is a more comprehensive explanation. I prefer this kind of material."* (Async − 15).

It is seen that another factor affecting the participation and appreciation of content-integrated social interactions of synchronous activity-oriented distance education students is related to their personality traits. It is seen that students' shyness, distraction, and negative attitudes toward online interaction negatively affect appreciation and participation.

> *"Everyone is at a certain level, and no one wants to make a simple mistake. This may have made us more reluctant to write messages."* (Sync − 19).
> *"I can't concentrate very much. Sometimes there is a situation that I do not notice when other people write something, but I still look at it, I wonder what he wrote? What did he say?"* (Sync − 20).
> *"There can be a lot of messaging, but I prefer face-to-face dialogue, I don't like online. I don't like participating in writing."* (Sync − 24).

When the individual factors are evaluated in general, the fact that the students in both study groups understand the subject and are competent in the subject and thus preparing an environment for them not to ask questions and therefore interact, positively affected their appreciation for the system, while negatively affecting their participation in the interaction. However, this situation affected some of the synchronous activity-oriented distance education students positively.

It has been observed that the lack of time, technical possibilities, and health problems of asynchronous activity-oriented distance education students negatively affect both participation and appreciation. It has been determined that the students' study of certain courses in the time period they have determined during the semester and their

preference for more comprehensive materials while studying, affect the appreciation and participation negatively in general.

It has been observed that the different learning habits of the synchronous activity-oriented distance education students, such as making use of pre-written messages, focusing only on the content, and individual learning dispositions negatively affect their participation in the interaction, but the effect of these learning habits on appreciation is variable. On the other hand, it has been revealed that the shyness of the students, the distraction, and the dislike of online interaction affect appreciation and participation negatively in general.

In Fig. 3 below, a summary concept map was created to present the factors affecting students' participation and appreciation in content-integrated social interactions. In
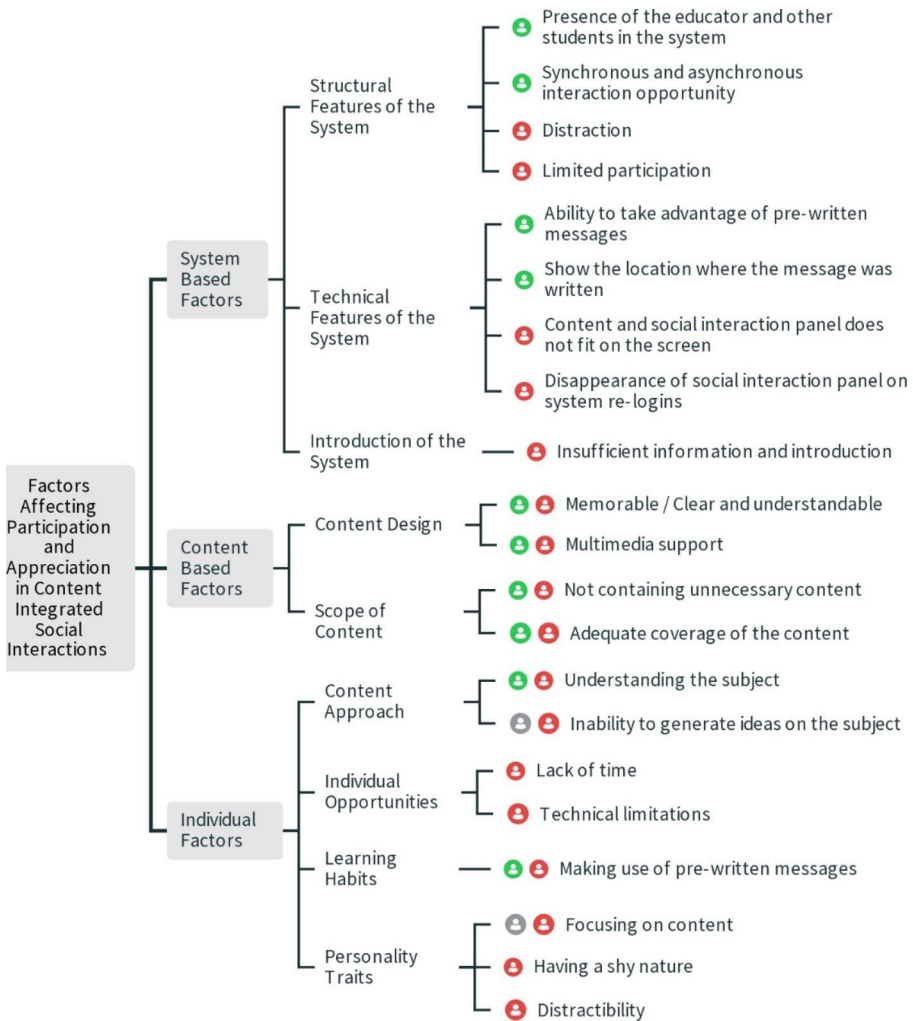
Fig. 3 Summary of Factors Affecting Participation and Appreciation in Content-Integrated Social Interactions

the concept map, especially the factors with high repetition frequency were included. "Green icons" were used for factors that had a positive effect on participation and appreciation, "red icons" were used for factors to express that it affected negatively, and "grey icons" were used for factors to express that it had no effect.

4 Discussion

This research aimed to examine the experiences of students who receive synchronous activity-oriented and asynchronous activity-oriented distance education regarding content-integrated social interactions. Within the scope of the research, the level of students' interaction in content-integrated interactions and the system-based, content-based, and individual-based factors affecting participation and appreciation in these interactions were examined. The results were interpreted and discussed in line with the research questions for both cases.

4.1 Students' level of social interaction integrated with the content

In the research, it was determined that the average time spent by the asynchronous activity-oriented distance education students in the content-integrated social interaction system was lower than the synchronous activity-oriented distance education students, and they generally spent this time studying the content. On the other hand, synchronously activity-oriented distance education students have spent a lot of time using the synchronous interaction panel, in addition to studying the content. It has been seen that these results are directly related to the factors affecting participation and appreciation, and the results are discussed in relation to the titles below.

4.1.1 System-based factors affecting participation and appreciation in content-integrated social interactions

The presence of other students in the system in content-integrated social interactions has been described as a strong factor affecting participation and appreciation by the asynchronous activity-oriented distance education students. On the other hand, the presence of educators in the system has been described as a strong factor affecting participation and appreciation by synchronous activity-oriented distance education students. Synchronous activity-oriented distance education students were involved in the interactions in the system in parallel with their views, and they had various interactions with educators and other students. In the literature, it is emphasized that the verbal and nonverbal communications that students have established with educators in e-learning environments significantly affect the learning process (Swan, 2001; Zhang, 2022). Because educators play both cognitive, effective, and managerial roles in learning environments (Coppola et al., 2001). Moreover, in their interactions with educators, students need to meet not only their academic needs based on the content but also their needs related to many different situations such as responsibilities related to the course and issues related to the digital tools used (Ragusa, 2017). In addition, the basic dynamics of the learning process are that students can ask ques-

tions by interacting with each other in e-learning environments, share ideas, sometimes harmony and sometimes disagreements in the sharing (Samuels-Peretz, 2014; Picciano, 2002; Wu et al., 2023).

Asynchronous activity-oriented distance education students positively evaluated the student-student and student-educator interaction opportunities offered to them in content-integrated social interactions, but they were not included in social interactions. It is particularly known that the students of institutions such as open education faculties, where distance education is conducted based on asynchronous activities, usually interact with each other by establishing continuous groups with communication tools such as social media, etc. (Aydın, 2016; Chugh & Ruhi, 2018; Kear, 2010). However, when the reason for the lack of interaction is evaluated, as the students stated in the interviews, it may be due to the limited number of participants in the system at the same time, as well as the different approaches of the students to the use of the system or the lack of sufficient knowledge about the system. Because asynchronous activity-oriented distance education students need constant information about innovations made in their learning processes (Bilgiç & Tüzün, 2015). The temporal and spatial distance in distance education systems complicates the adaptation process to innovations (Ford, 2021; Kiltz et al., 2020), and students constantly expect academic, technical, and administrative support (Moore & Kearsley, 2012). Although the information was provided through various channels in the current study, this information may not have adequately met the needs of the students. In the student interviews, this situation was mentioned in a small number, but it was seen that the students did not have enough implicit motivation with their approach. This result shows that motivational supports beyond information and guidance are also important for the dissemination of innovation in distance education processes.

The effect of the technical features of the system on participation and appreciation in content-integrated social interactions was especially emphasized by synchronous activity-oriented distance education students. The most prominent of these features was the ability to benefit from what was written before in the system. However, some students stated that this feature indirectly affects participation negatively. Because these students did not feel the need to interact by reading what was written before voicing a question or problem in their minds if it was already discussed. In the literature, it has been emphasized that one of the most important reasons why students are not involved in the interactions offered through discussion forums is that students prefer to remove their question marks by reading existing correspondence (Fung, 2004). On the other hand, it is emphasized in the literature that interaction behaviors in online discussion platforms differ according to students' cognitive levels (Liu et al., 2023; Ouyang & Chang, 2019) or personality traits (Duran, 2020). However, this situation is not considered as a problem since the main purpose of the research is to meet the learning needs of the students.

The fact that the interactions offered to the students are integrated with the content has also been evaluated as a factor that positively affected the participation and appreciation of the synchronous activity-oriented distance education students. Thanks to the visibility of the page title/position of the content of the message, the students could easily understand what topic the other students were talking about while they were chatting, and they were able to associate the messages written in the

discussion forum with the relevant topic. In applications with crowded students in synchronous interaction environments, the messages written by the students can be confusing and can time out (Kuyath et al., 2013; Polat, 2016). However, the system used in the research was described as functional by the students with its integration with the content and the useful structure of the chat section offered as a synchronous interaction option.

4.1.2 Content-based factors affecting participation and appreciation in content-integrated social interactions

In the research, when the content-related factors affecting the participation and appreciation of students in social interactions integrated with the content were examined, it was determined that the design and scope of the content had a significant effect on participation and appreciation. In this context, the fact that the content is enriched with multimedia elements clearly and understandably and that it does not cause confusion by eliminating unnecessary details had a positive effect on the appreciation of the students, while indirectly negatively affecting their level of participation in the interactions. Well-designed course contents in e-learning environments are very important in terms of making the learning process efficient (Anderson & Elloumi, 2004; Conrad, 2000; Wang et al., 2022). Because in traditional learning environments, educators can easily transfer information to students by using different methods and techniques. However, since this situation is more difficult in e-learning environments, the quality of the material presented to the students can be considered one of the most important elements that keep the student in the learning environment (Conrad, 2000, 2014; Grace & Smith, 2001; Yu et al., 2020). When this situation is evaluated specifically for the students of asynchronous activity-oriented distance education institutions such as open education faculties, these students are mostly adults and individuals with different responsibilities (Cercone, 2008; Kara et al., 2019) and there are time limitations (Fung, 2000) and therefore they need materials that can effectively obtain information in a short time. Therefore, the design and scope of the e-learning contents used in the study prepared an environment for the students to easily reach their course goals individually and thus not need to interact. Therefore, it can be said that if a target audience accustomed to self-study encounters carefully prepared content that will make it easier to understand, these contents can prevent interaction by reducing the need for social interaction. Similarly, it is emphasized in the literature that distance education students tend to participate in activities that usually require compulsory participation and contribute to the evaluation process if they meet their academic needs (Bernard & Lundgren-Cayrol, 2001; Kahu et al., 2015; Mason, 2000).

4.1.3 Individual factors affecting participation and appreciation in content-integrated social interactions

It was revealed that the asynchronous activity-oriented distance education students understood and mastered the subject and this created an environment in which they did not need to ask questions and therefore interact, and this situation affected their

appreciation positively and indirectly affected their participation in the interaction negatively. This result shows that students did not sufficiently participate in the interactions, especially because they did not need academic support. When the literature is examined, it is stated that different individual characteristics of distance education students affect the support services they receive in the learning process in different ways (Glazer et al., 2013; Ko & Rossen, 2010; Moore & Kearsley, 2012). There are also educational needs in the focus of interaction in online learning communities (Ilgaz & Aşkar, 2009; Zhang, 2022). Therefore, it can be observed that students tend to participate only in activities that they think are productive for them (Clark, 2001; Kahu et al., 2015). On the other hand, it was revealed that the individual possibilities of the students, such as technical possibilities and talent limitations, negatively affected participation and appreciation. Because the interaction alternatives offered to students in distance education environments can only appeal to students within technical possibilities (Taat & Francis, 2020). It was observed that another individual factor limiting the participation of asynchronous activity-oriented distance education students was their habits such as studying in a time period they determined for each lesson during the semester and preferring comprehensive materials while studying for a lesson. This result can be meaningful when considering the general examination structure, the comprehensive units offered to the students, and the fact that the students are generally adults with different responsibilities (Cercone, 2008; Kara et al., 2019; Thompson & Porto, 2014), especially in the asynchronous activity-oriented learning processes in open education faculties.

Synchronous activity-oriented distance education students' understanding and mastery of the subject positively affected their appreciation and participation in the system, as in the other study group, while some students did not need to interact, which negatively affected their participation. This situation can be explained by individual differences (Liu et al., 2023; Ouyang & Chang, 2019). If this difference is considered in terms of intelligence type, an individual with high social intelligence is expected to share what he knows with other students even if he has mastered the relevant subject, while an individual with a more introverted intelligence level cannot be expected to interact with other students if he or she has mastered the subject (Kosmitzki & John, 1993). Similarly, in relation to this situation, some students stated that they had individual learning tendencies. Every student learns differently due to their own nature. While some students direct the process of constructing knowledge by communicating with other individuals, sharing ideas, and participating in discussions, some students prefer to construct knowledge only by going through their own mental processes (Başaran, 2004; Selçuk et al., 2004). Therefore, this result in the present study is an expected situation.

5 Conclusion and recommendations

When the results of the research are evaluated in general, it has been revealed that especially the asynchronous activity-oriented distance education students participated in content-integrated social interactions at a limited level. In the case that students cannot participate in activities based on interactions during distance education

processes, it may be necessary to guide students with extra motivational interventions other than informing to increase interactions. At this point, it can be ensured that the interaction process is an active process with applications such as scoring participation in the interaction at certain rates and developing badges and reward systems based on different criteria.

The results of the research show that participation and appreciation for content-integrated social interactions should not be directly correlated with the system features offered to students, on the contrary, they can be associated with very different variables such as individual characteristics, subject area, presentation mode (synchronous or asynchronous activities). Similarly, in the research, it was seen that personal characteristics of students such as having a shy nature, being distracted, and not liking online interaction also affect participation and appreciation in content-integrated social interactions. On the other hand, it has been revealed that students studying in programs such as open education faculties that provide asynchronous activity-oriented education show a content-oriented approach in systems where content and interaction are integrated. Directly related to this result, it was determined that the features that affect the participation and appreciation of students in such systems are mostly content-based. However, it has been revealed that students studying in synchronous activity-oriented programs such as distance education programs tend to use the interaction platform in addition to the content in systems where content and interaction are integrated. Similarly, in relation to this result, it was found that the features that affected students' participation and appreciation in such systems were mostly the structural and technical features of the system in which social interactions integrated with the content were presented.

In the research, it was seen that, unlike traditional forum discussions, the content-integrated social interaction approach paved the way for a more natural interaction environment among students. The fact that the interactions that took place during the research process were not task-oriented and that the discussions could be initiated by the students made the interactions flexible and also reduced the responsibilities of the educators such as preparing questions, starting a discussion, or managing. For this reason, content-integrated social interaction systems can be used in distance education institutions to increase content-oriented interactions without teacher addiction. In this process, students can choose and use synchronous and asynchronous interaction alternatives such as student-student and student-educator offered to them in line with their instant needs. On the other hand, it is beneficial for educators to actively follow these processes and provide regular feedback, but avoid over-interventing students and provide more metacognitive guidance.

Declarations

Conflict of interest None.

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