

Societal bonds in virtual spaces: exploring the sense of community in online student communities at Anadolu University's Open Education System

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Abstract

Purpose – This study aims to investigate the levels of the sense of community among students enrolled in online student communities at Anadolu University Open Education System (OES), as well as their motivations for joining these communities and their expectations.

Design/methodology/approach – An explanatory sequential design incorporating mixed research methods was employed as the research framework for this study. Quantitative data were collected from 1,065 students enrolled in online student communities during the 2021–2022 academic year, while qualitative data were obtained from 14 students after the survey using an extreme case sampling method. The quantitative data were analyzed using descriptive statistics, independent samples *t*-tests, one-way analysis of variance tests, correlation analysis and regression analysis. The qualitative data were analyzed using content analysis.

Findings – The study results indicate that students enrolled in online student communities generally have higher levels of a sense of community. These levels did not significantly differ based on gender, employment status, entry type to the university, program studied or membership status in more than one community. However, significant differences were observed in terms of age, time spent in communities and meeting attendance. Additionally, students' perceptions of social presence had a significant effect on their sense of community.

Originality/value – This study is the first to investigate the sense of community in online student communities at Anadolu University's OES.

Keywords Open education, Distance education, Online learning communities, Sense of community, Social presence

Paper type Research paper

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Introduction

Developments in information and communication technologies have led to changes and innovations in various fields, including education. Thanks to technological advancements, students now engage in interaction and idea exchange with instructors and peers using both synchronous and asynchronous communication tools (Hopkins *et al.*, 2023), thereby forming online communities. According to Westheimer and Kahne (1993), a “community” is a structure formed through interaction and negotiation among individuals who share common goals and interests. This concept applies to people in a workplace or students in a classroom, as they also constitute communities.

Student communities are established to allow students to engage in social, cultural, scientific, artistic, and intellectual activities while spending their time outside of their educational activities. Student communities are considered extracurricular activities that assist students’ learning by educators. Burggraaf (1997) stated that student communities play a significant role in developing interpersonal skills and acquiring new skills such as verbal and written skills. Furthermore, researchers have noted that participation in communities enhances motivation and fosters self-confidence (Burggraaf, 1997; Kahl, 1998; Montes and Collazo, 2003; Pittaway *et al.*, 2015). Humans are social beings and learn in every environment where they interact. Students continue to learn not only in the classroom but also in all environments where they interact (Aydin, 2002). Therefore, students need environments that include activities aimed at developing and supporting their social skills. These communities offer students opportunities such as socializing, learning, and being a community. This opportunity to be a community, which is offered to students in face-to-face education, can also be offered to students receiving online education. In online environments, students mostly complain about the feeling of isolation (Morgan and Tam, 1999). The fact that students are physically located in different places in online environments makes them feel lonely and reduces their sense of community.

Sense of community

McMillan and Chavis (1986) argued that a sense of community is characterized by members’ belief that their needs will be met through their association, coupled with a sense of awareness and belonging. Furthermore, they stated that the sense of community is comprised of four basic components: membership, influence, integration and fulfillment of needs, and shared emotional connection. Membership refers to the feeling of belonging to the community; influence refers to the sense of caring for the group and being important to group members; integration and fulfillment of needs refers to the shared emotional connection; and shared emotional connection refers to the commitment and belief shared by members. Additionally, the researchers emphasized that participants’ social presence levels should be increased to foster an ideal online learning community. Within this context, social presence is one of the indicators that help build a sense of community (Pham *et al.*, 2023). Rovai (2000) advocated the need for social presence in building a strong sense of community and argued that the sense of community decreased with a decrease in social presence.

The term *sense of community* was first coined in the field of psychology. However, given its broad nature, it has been the subject of research in diverse fields such as management, sociology, and education, with studies examining its relationship with various variables. In the study conducted by Chatterjee and ve Correia (2020), which involved 396 students from undergraduate and graduate programs, a moderate relationship between collaboration and a sense of community was found. It was observed that when students had positive attitudes towards collaborative learning, their sense of community increased. Trespalacios and Perkins (2016) conducted a study with 15 students in a graduate-level online instructional design course. The research revealed that different activities were associated with students’

perceived learning and sense of community. As students' instructional design skills improved, they felt more connected to each other and thus experienced a sense of community in the class. [Beeson et al. \(2019\)](#) investigated 339 students enrolled in graduate-level distance education programs using the same instructional technology. The study found that increased interaction with other students and instructors outside of class, technological proficiency, and age had significant effects on the formation of a sense of community. It was also concluded that individuals identifying as male had higher sense of community scores than females, and those identifying as Black or African American had a stronger sense of community compared to other groups. In [Rovai's \(2002a\)](#) study involving 314 students, it was found that there was a significant relationship between classroom community and perceived cognitive learning in an online educational environment. The research results indicated that students with a strong sense of community were more inclined towards higher levels of cognitive learning, and female students had higher levels of commitment and perceived cognitive learning compared to male students. However, ethnicity and course content did not affect the sense of community and perceived cognitive learning. Many studies have been conducted on understanding and improving the factors that affect the sense of community in traditional and online learning environments. Most of these studies focused on measuring the sense of classroom community in learning environments ([Rovai, 2002a](#); [Shackelford and Maxwell, 2012](#); [Erdem-Aydm and Gümüő, 2016](#); [Shi and Weber, 2017](#); [Chatterjee and ve Correia, 2020](#)). However, humans are social beings and form communities outside the classroom. In this context, no study examined how the sense of community changed in online student communities where students interacted socially or culturally.

This study aims to explore the levels of sense of community among students who voluntarily enroll in online communities at the Open Education System (OES) of Anadolu University. It also seeks to understand their motivations for joining these communities and their expectations. To achieve this, the study addresses the following sub-problems:

- (1) What is the sense of community level of students enrolled in online student communities?
- (2) Is there a significant difference between the sense of community levels of students enrolled in online student communities and the following variables?
 - Gender
 - Age
 - Employment status
 - The type of entry to the university
 - Time spent in the community
 - Attendance to meetings
 - Programs they are studying
 - Membership status in more than one community
- (3) Is there a relationship between the sense of community levels of students enrolled in online student communities and their perceptions of social presence?
- (4) Do the social presence perceptions of students enrolled in online student communities have a significant effect on their sense of community?
- (5) What are the reasons for students enrolled in online student communities?

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- (6) What are the expectations of students enrolled in online student communities?
 - (7) What are the benefits of online student communities for students' personal development and learning process?

Methodology

Research context

Online student communities at Anadolu University's OES were established during the 2016–2017 academic year with the goal of offering informal learning support to students in specific degree programs, including Literature, Radio and TV Program Production, Photography and Camera Operation, and History. Under the slogan "Draw your own boundaries," communities such as the Book Community, Cinema Community Photography Community, and History Community were formed (Uçar, 2022). Over time, these student communities began to attract the interest of students from various programs, extending beyond their initial purpose. They evolved into social support tools that reached students across all programs. Subsequently, the Music Community, Informatics Community, Sociology Community, and Design Community were added to this list. Each community is guided and led by an academic expert in the relevant field.

All students enrolled in the OES have the option to voluntarily join these online student communities free of charge. They can actively participate in the communities' activities, engage with experts in real-time, and interact with their peers. Monthly meetings and events are announced in advance on the university's website and official social media accounts. Additionally, all organized events are recorded and made available on the Learning Management System (LMS) for those who may have missed them.

Method and research model

This study used an explanatory sequential design, one of the mixed research methods. The purpose of the explanatory sequential design is to start with a quantitative study and explain the results obtained in this stage with qualitative studies (Fetters, 2019). Hence, in the present study, the quantitative data were collected and analyzed, and the participants of the qualitative study were determined. The qualitative data were then collected and analyzed, and finally, the quantitative and qualitative data were correlated. An Ethical Approval document was obtained from the Anadolu University Ethical Board before starting the data collection process.

Participants

The study population included the students enrolled in the Anadolu University OES online student communities in the fall-spring semesters of the 2021–2022 academic year. Students could become members of online student communities at any time, and the number of their members increased daily. Therefore, a net number within a semester could not be reported. Further, students could become a member of any community they wished at the same time, and hence a specific number could not be reached on a community basis. However, it was possible to know the total number of students in all eight current communities. According to June 2022 data, 325,996 unique users were enrolled in all communities. The number of students in the first six months of 2022 in all eight categories of online student communities is presented in [Table 1](#).

The quantitative data were collected using the convenience sampling method from 1,065 students who voluntarily participated in the study survey among the students who were members of online student communities. The questionnaire, including a personal

information form and two separate scales, was sent to the students as an online form via the LMS, Anadolom e-Campus System. Of the students, 1,180 completed the questionnaires. However, 1,065 of them were found to be valid based on the evaluations made. The distribution of the demographic characteristics of the students who participated in the quantitative dimension of the study is depicted in Table 2.

As depicted in Table 2, of the 1,065 students who participated in the study, 576 were female and 489 were male. Further, 38 of the 1,065 students were aged 18–19 years, 404 were aged 20–29 years, 234 were aged 30–39 years, 206 were aged 40–49 years, and 183 were older than 50 years. In terms of employment status, 284 were students, 86 were retired, 316 worked in the private sector, and 244 worked in the public sector; however, 135 stated that they did not join in any job. Regarding enrollment type, 232 students were enrolled for the first time, 680 were enrolled for the second time, 106 joined through external transfers, and nine joined through internal transfers. Of the total students, 38 stated that they had graduated from the Open Education program they were enrolled in and continued to be members of student communities. Further, 540 students were enrolled in associate degree programs and 525 in undergraduate programs under the OES. Regarding their participation in monthly online meetings, 453 students stated that they never attended the meetings, 137 attended regularly, and 475 attended occasionally. Regarding the time the students allocated weekly for the communities, 689 stated that they allocated 0–1 h per week, 309 allocated 2–4 h per week, 43 allocated 5–7 h per week, and 24 allocated 7 h or more per week. Of the total students, 368 were enrolled in informatics, 393 in photography, 498 in books, 274 in music, 328 in cinema, 312 in sociology, 305 in history, and 278 in design communities. The students could enroll in more than one student community at the same time; hence, the total number of students was 2,756.

Based on the analysis of the quantitative data obtained, the researchers of the study conducted in-depth interviews with students who exhibited high or low levels of sense of community. These participants were selected using extreme or deviant case sampling. Qualitative data were collected from 14 students, 7 with high levels of sense of community and 7 with low levels of sense of community. The interviewed students were coded as S1, S2, S3, . . . , S14. Of the 14 participants, 7 were female and 7 were male. Regarding age groups, one student was 20–29 years, four were 30–39 years, four were 40–49 years, and five were older than 50 years. In terms of communities, six students were enrolled in informatics, four in photography, eight in books, two in music, five in cinema, six in sociology, five in history, and six in design.

Data collection

The data for the quantitative dimension of the study (Research question 1, 2, 3, and 4) were collected using the Online Sense of Community Index-2, Social Presence Scale, and personal

Community	January	February	March	April	May	June
Informatics	84,210	87,301	88,462	89,380	89,822	90,013
Photography	98,719	101,911	103,066	104,054	104,551	104,795
Book	139,233	144,031	145,822	147,069	147,640	147,962
Music	62,916	64,891	65,647	66,269	66,616	66,766
Cinema	92,981	96,664	98,023	99,204	99,730	100,044
Sociology	36,586	39,727	40,978	41,865	42,363	42,577
History	76,077	78,495	79,461	80,165	80,514	80,702
Design	3,915	7,479	8,846	9,793	10,279	10,504
Total	594,637	620,499	630,305	637,799	641,515	643,363

Source(s): Table by authors

Table 1.
Number of students
enrolled in
communities
according to January–
June 2022 data

Variable		<i>n</i>	%
Gender	Female	576	54.1
	Male	489	45.9
Age groups	18–19	38	3.6
	20–29	404	37.9
	30–39	234	22.0
	40–49	206	19.3
	50 and above	183	17.2
Employment status	Student	284	26.7
	Retired	86	8.1
	Private sector	316	29.7
	Public sector	244	22.9
	Not working	135	12.7
Entry type to the university	First entry/university	232	21.8
	Second university	680	63.8
	External transfer	106	10.0
	Internal transfer	9	0.8
	Graduate	38	3.6
Program	Associate	540	50.7
	Undergraduate	525	49.3
Participation in meetings	No	453	42.5
	Occasionally	475	44.6
	Yes	137	12.9
Time (h)	0–1	689	64.7
	2–4	309	29.0
	5–7	43	4.0
	7 and more	24	2.3
<i>Total</i>		<i>1,065</i>	<i>100</i>
Student community	Informatics	368	13.4
	Photography	393	14.3
	Book	498	18.1
	Music	274	9.9
	Cinema	328	11.9
	Sociology	312	11.3
	History	305	11.1
	Design	278	10.1
<i>Total</i>		<i>2,756</i>	<i>100</i>

Table 2.
Demographic characteristics of the students participating in the quantitative dimension of the study

Source(s): Table by authors

information form. Additionally, a semi-structured interview form was used as a data collection tool for the qualitative dimension (Research question 5,6, and 7).

Online Sense of Community Index-2: This scale was based on the sense of community theory proposed by [McMillan and Chavis \(1986\)](#) and developed by [Chavis et al. \(2008\)](#) for online students using the Sense of Community Index. The Turkish adaptation study was conducted by [Gökçearsan \(2013\)](#). This four-point Likert-type scale includes three factors and 28 items, 11 of which are reverse-scored. The responses in the “concordance” and “similarity” factors are as follows: 1 = completely disagree, 2 = disagree, 3 = agree, and 4 = completely agree. For “independence” factor, the responses are as follows: 4 = completely disagree, 3 = disagree, 2 = agree, 1 = completely agree, because the items in this factor are scored reversely. For the reliability of the online learning community feeling scale, the Cronbach’s alpha internal consistency coefficient calculated by the scale developer based on item analysis was 0.88 for the whole factor and the test-retest reliability coefficient of the scale was 0.82. The scale used is presented in [Appendix 1](#).

Social Presence Scale: This scale was developed by [Kang et al. \(2007\)](#) based on the study titled “Construction and Validation of a Social Presence Scale for Measuring Online Learners’ Involvement” and adapted into Turkish by [Olpak and Kılıç Çakmak \(2009\)](#). It is a five-point Likert-type scale and includes three 3 factors and 19 items. The items are scored based on the following responses: 1 = strongly disagree, 2 = disagree, 3 = not sure, 4 = agree, 5 = strongly agree. The construct validity of the instrument was examined by the developers with confirmatory factor analysis, and the ratio of the chi-square fit test to the degree of freedom (χ^2/SD) was found to be 5.11. The Cronbach’s alpha values calculated for the reliability of the scale were between 0.79 and 0.91 for the factors and 0.94 for the whole scale. The scale used is presented in [Appendix 2](#).

Personal Information Form: This form was prepared by the researchers to obtain the demographic information of the participating students within the scope of the study. The information about the gender, age, employment status, type of enrollment, time spent in the communities, participation in monthly online meetings, the open education program the students were enrolled in, and the student community they were enrolled in was obtained using this form. The form used is presented in [Appendix 2](#).

Semi-structured Interview Form: This form was prepared by the researchers to answer the research questions 5, 6 and 7. The interview form included seven open-ended questions to determine the reasons why students enrolled in online communities and what kind of expectations they had. The interview with the students was conducted via the Zoom Meetings program, and audio recording permission was obtained from the students before the interview.

Data analysis

The quantitative data were analyzed using SPSS 24 statistical software. The missing and extreme value analysis was performed on 1,065 students before analyzing the quantitative data. Then, the assumptions of normal distribution and the homogeneity of variances were examined for the data, revealing that the assumptions were met. It was decided to conduct independent samples *t*-test, one-way analysis of variance (ANOVA), correlation analysis, and regression analysis, which are among parametric tests. When a significant difference was found between the groups as a result of ANOVA, Tukey’s or Tamhane’s test was performed to determine the difference. Descriptive statistics were applied to determine the students’ sense of community levels. The independent samples *t*-test was applied to determine whether the students’ sense of community levels differed according to gender, the Open Education program they were enrolled in, and membership in more than one community. ANOVA was applied to determine whether students’ sense of community levels differed according to age, employment status, enrollment type, time spent in communities, and participation in online meetings. The Pearson product-moment correlation coefficient technique was used to determine whether a significant relationship existed between the sub-dimensions of the online sense of community scale and social presence scales and to measure the degree of relationship. Regression analysis was performed to explain how students’ perceptions of social presence affected their sense of community levels. The analyses were conducted based on 0.05 and 0.001 significance levels.

The content analysis method and NVIVO-10 program were used in the qualitative analyses in this study. In the first stage, the researchers independently analyzed the data, formulated codes and themes, and subsequently evaluated them together. Furthermore, the reliability of the qualitative analysis was calculated using the [Miles and Huberman \(1994\)](#) formula for the analysis of the researchers, which was found to be 92%. A calculated reliability value above 80% was sufficient for the reliability of the study ([Miles and Huberman, 1994](#)).

Findings

Quantitative findings

When the level of sense of community of the students regarding the first research question was examined, it was found that the students enrolled in online student communities had a high level of sense of community ($\bar{x} = 3.01, s = 0.467$). Hence, the participating students' sense of isolation was low, and students felt that they belonged to the community.

The independent samples *t*-test was conducted to determine whether the students' sense of community differed in terms of gender, the program in which the students are studying, and being a member of more than one community (research question 2; items a, g, and h). The results are presented in Table 3.

As shown in Table 3, no significant difference was found between the sense of community levels of students enrolled in online student communities and their gender ($t = 0.09; df = 1,063; p > 0.05$), the Open Education program they were enrolled in ($t = -0.51; df = 1,063; p > 0.05$), and their membership in one community or more than one community ($t = 1.38; df = 1,063; p > 0.05$).

ANOVA was conducted to determine whether the sense of community levels of the participating students differed according to their age, employment status, enrollment type, time spent in communities, and participation in meetings (research question 2; items b, c, d, e, and f). The results are presented in Table 4.

As shown in Table 4, a significant difference was observed between students' sense of community and age ($F = 5.30; p < 0.001$), time spent in communities ($F = 6.78; p < 0.001$), and participation in meetings ($F = 13.99; p < 0.001$). The analysis results revealed a significant difference between students aged 20–29 years and those aged 50 and above ($MD = -0.19; p < 0.001$). Students aged 50 and above had higher levels of sense of community than students in other age groups ($\bar{x} = 3.14, s = 0.385$). A significant difference was found between students who allocated 0–1 h per week to online student communities and those who allocated 2–4 h ($MD = -0.11; p < 0.05$). According to the weekly time allocated for communities, students who allocated 2–4 h had higher levels of sense of community ($\bar{x} = 3.08, s = 0.488$) compared with those who allocated 0–1 h ($\bar{x} = 2.97, s = 0.448$). A significant difference was found between students who never attended the monthly meetings organized in online student communities and those who attended occasionally ($MD = -0.16; p < 0.001$) and between students who never attended and those who attended regularly ($MD = -0.14; p < 0.05$). In terms of participation in monthly online meetings (in descending order), the sense of community levels of students who participated occasionally ($\bar{x} = 3.08, s = 0.462$) was higher than those of the students who never participated ($\bar{x} = 2.92, s = 0.437$). Similarly, the sense of community levels of students who participated in meetings regularly ($\bar{x} = 3.06, s = 0.524$) were higher than those of the students who never participated in meetings ($\bar{x} = 2.92, s = 0.437$). In this context, it could be argued that students who participated in the meetings regularly and occasionally had higher levels of sense of

		<i>n</i>	\bar{x}	<i>s</i>	<i>t</i>	<i>df</i>	<i>p</i>
Gender	Female	576	3.01	0.462	0.09	1,063	0.924
	Male	489	3.01	0.473			
Program	Associate	540	3.01	0.466	-0.51	1,063	0.609
	Undergraduate	525	3.02	0.469			
Community	Member of one community	500	3.03	0.467	1.38	1,063	0.167
	Member of more than one community	565	2.99	0.467			

Source(s): Table by authors

Table 3.
T-test results on students' sense of community levels

		<i>n</i>	\bar{x}	<i>s</i>	<i>F</i>	<i>p</i>	<i>PH</i>	Asian Association of Open Universities Journal
Age (year)	1. 18–19	38	2.96	0.498	5.30	<0.001	2–5	
	2. 20–29	404	2.95	0.493				
	3. 30–39	234	3.03	0.471				
	4. 40–49	206	3.02	0.453				
	5. 50 and above	183	3.14	0.385				
Employment status	1. Not working	135	2.96	0.430	2.82	0.60	–	
	2. Student	284	2.95	0.483				
	3. Retired	86	3.06	0.410				
	4. Private sector	316	3.04	0.465				
	5. Public sector	244	3.06	0.482				
Entry type to the university	1. First entry/university	232	3.00	0.488	1.17	0.34	–	
	2. Second university	680	3.03	0.445				
	3. External transfer	106	2.94	0.484				
	4. Internal transfer	9	2.73	0.815				
	5. Graduate	38	3.08	0.541				
Time spent (h)	1. 0–1	689	2.97	0.448	6.78	<0.001	1–2	
	2. 2–4	309	3.08	0.488				
	3. 5–7	43	3.14	0.508				
	4. 7 and more	24	3.19	0.486				
Participation in meetings	1. No	453	2.92	0.437	13.99	<0.001	1–2 1–3	
	2. Occasionally	475	3.08	0.462				
	3. Yes	137	3.06	0.524				

Source(s): Table by authors

Table 4.
One-way ANOVA
results on students'
sense of community
levels

community than those who never attended the meetings. No significant difference was observed between students' sense of community levels and their employment status ($F = 2.82; p > 0.05$) and enrollment type ($F = 1.17; p > 0.05$).

A correlation analysis was conducted to determine the relationship between the level of sense of community and social presence perceptions of students enrolled in online student communities (research question 3). As a result, a statistically significant, positive, and high-level relationship was observed between students' sense of community levels and their perceptions of social presence ($r = 0.51; p < 0.01$). In this context, it could be argued that the sense of community levels of students increased with the increase in their perceptions of social presence.

A simple linear regression analysis was applied to determine the effect of social presence perceptions of students enrolled in online student communities on their sense of community (research question 4). The results are presented in Table 5.

As shown in Table 5, the social presence subfactors explained the sense of community by 29% ($F = 140.89, p < 0.001$). Hence, 29% of the change in the students' sense of community levels was due to their perceptions of social presence. Beta coefficients were analyzed to

Dependent variable	Social presence subfactors	<i>B</i>	<i>SE B</i>	β
Sense of community	Co-presence	0.204	0.053	0.204**
	Influence	–0.177	0.070	–0.177**
	Cohesiveness	0.514	0.064	0.514**
	Stable	–3.99	0.026	–

Note(s): ** $p < 0.01, R^2 = 0.29; F = 140.89; p < 0.001$

Source(s): Table by authors

Table 5.
Effect of students'
perceptions of social
presence on sense of
community

examine the effect of social presence subfactors on the sense of community. The co-presence and cohesiveness subfactors significantly and positively affected the sense of community ($\beta = 0.204, p < 0.01$ and $\beta = 0.514, p < 0.01$, respectively), whereas the influence subfactor significantly and negatively affected it ($\beta = -0.177, p < 0.01$). Additionally, the review of the standardized regression coefficients revealed that the influence subfactor affected the students' sense of community the most, followed by the cohesiveness and co-presence subfactors.

Qualitative findings

The results obtained from qualitative analysis of the data were discussed in terms of expectations, experiences, reasons for enrollment, contribution to personal development, contribution to the learning process, and suggestions of students.

Expectations: Based on the qualitative analysis, meeting expectations, general expectations, and community-based expectation sub-themes were developed within the context of the expectations theme. The analysis of the fulfillment of students' expectations revealed that some expectations of the students were met and some others were not. The general expectations of the students were to gain knowledge, interact, and socialize. The community-based expectations of students with low levels of sense of community were to receive education from the informatics community and get to know people in the same sector; to learn new information, receive book recommendations, and interact with each other from the philosophy community; to create an online virtual choir and conduct interactive music interviews from the music community; and to receive movie recommendations from the cinema community. Students with high levels of sense of community expected to gain new knowledge from the cinema community and specific, concise information from the history community.

I am enrolled in the informatics community. I wanted to meet more people from the same sector. (S4)

Experiences: Positive and negative experience sub-themes were developed within the context of the experience theme. The positive experiences of students with low levels of sense of community included the opportunity to learn from the field experts, the opportunity to watch from the recordings, considering distance education students, and the usefulness of communities. The negative experiences of the students with low levels of sense of community included lack of information, inappropriate activity hours, and no interest in students, and the activity programs were not specified in advance. The positive experiences of students with high levels of sense of community included the development of their sense of belonging, opportunity to learn from field experts, usefulness of communities, opportunity to develop, opportunity to watch from the recordings, and benefits for graduates. The negative experiences of students included insufficient information provision, few number of events, and little interaction with students.

We aren't informed about new events without following the community's page; the lack of events breaks communication. (S14)

It is good that they organize events for us who are students in Open Education programs. (S5)

Reasons for enrollment: The qualitative analyses showed that the reasons for enrollment of students with high levels of sense of community included the sub-themes of interest, self-improvement, and socialization. However, the reasons why students with low levels of sense of community enrolled included the sub-themes of making use of leisure time, gaining an environment, being an example for young people, following current events, field of interest, self-improvement, raising the level of culture, and socializing.

To raise my general culture level, follow current events. In addition, I am retired; I joined these communities in order not to be too idle in retirement. (S7)

Contribution to personal development: All of the students with low levels of sense of community stated that participating in communities contributed to their personal development. One of the students with high levels of sense of community stated that participating in communities did not contribute to their personal development, but the others stated that it did.

I don't think that participating in the community contributed as much as I would have anticipated. I honestly don't know whether this is because I've already been overly engaged in history for years, or because the current system doesn't have enough information. Perhaps, if I had less information, I could benefit more from it. (S9)

Contribution to the learning process: Some of the students stated that participating in communities contributed to their learning process; however, others stated that it did not.

I was interested in the books recommended in the community, but I don't think they directly contributed to my education. (S14)

I think it contributes. Sometimes a topic discussed in the community can overlap with the courses we take, so it is useful in this sense. (S5)

Suggestions made by students: Within the context of suggestions from students with a high sense of community, research, informing, offline events, online events, orientation, social media, and face-to-face activities themes were developed. The informing theme included being informed via e-mail and SMS; the offline events theme included assigning students, certified training programs, and competitions. The online events theme included increasing the number of events, interactive activity, evaluation meetings, and pre-interviews; the orientation theme included meeting activity; and the social media theme included diversifying posts. In the context of suggestions from students with low levels of sense of community, informing, offline events, online events, reward systems, orientation, social media, time difference abroad, and face-to-face activity sub-themes were developed. The informing theme included being informed via announcement section, reminders, social media announcements, WhatsApp group, YouTube advertisements, e-mail, and SMS; the offline events theme included assigning students, certified training programs, discussion forums, and competitions; the online events theme included interviewing with famous people in the field, increasing the number of events, interactive activities, and activities with the appointment system. The orientation theme included meeting activities and introductory application; the social media theme included diversifying posts and establishing a community-specific social media channel, WhatsApp, and Telegram groups.

Research must first be done to gather people under one roof. You need to find out what people like the most and how you can attract them. Of course, you need to do the things they like in order to attract them to the community. (S8)

Discussion and conclusions

The results show that the students enrolled in online learning communities have higher levels of sense of community. Students who had low scores on the Online Sense of Community Index-2 did not feel close to the community, which decreased the quality of their socialization and learning experiences. Students who scored high on the scale felt that they were part of the community, which increased the permanence of their experiences. This result coincides with the results of [Koçdar et al. \(2018\)](#) and [Harrison and West \(2014\)](#).

The findings also indicate that the gender variable did not have a significant effect on the sense of community formation of the students participating in the present study. This result corresponds with the findings of Öztürk and Deryakulu (2011), Shackelford and Maxwell (2012), and Ijatuyi *et al.* (2023), however, it does not align with the findings of Rovai (2002b), Shi and Weber (2017), Beeson *et al.* (2019) and Cope *et al.* (2021). In their study, Rovai (2002b), Shi and Weber (2017), and Cope *et al.* (2021) reported that female students had a greater sense of community than male students. However, Beeson *et al.* (2019) found that male students had a greater sense of community than female students. These differences in results can be attributed to the structure of the communities. In the mentioned studies, the communities were learning communities, whereas the communities in this study are optional socializing environments where students interact with each other and with field experts.

The findings also reveal that the sense of community levels of students enrolled in online student communities differ significantly according to age. Students aged 20–29 years and those older than 50 years had higher levels of sense of community than students in other age groups. This result coincides with the findings of Ijatuyi *et al.* (2023) and Beeson *et al.* (2019). On the contrary, Shackelford and Maxwell (2012) and Moisseron-Baudé *et al.* (2022) found that students' sense of community levels did not differ according to age. These results are not in line with the results of the present study. This difference is probably due to the wide or narrow age range of the students with whom the research is conducted.

Another result of the study highlights that the sense of community levels of students enrolled in online student communities differ significantly according to the time the students spent in the communities. Students who spent 0–1 h and 2–4 h per week in these communities had higher levels of sense of community than those who spent 5–7 h and more than 7 h. The students who spent less time in communities had higher levels of sense of community than those who spent more time, which was an unexpected result. This finding could be attributed to the scale items or the difference in the number of students.

Persistence in participation in community activities is an important factor in fostering a sense of community. The results reveal that the sense of community levels of students enrolled in online student communities differed significantly based on their participation in the meetings. The sense of community levels of the students who attended the meetings regularly were higher than those who never attended the meetings. Furthermore, it was concluded that students' sense of community levels increased with their perceptions of social presence, aligning with Rovai's (2000) argument.

The analysis of the qualitative data revealed that the common reasons for students enrolling in the communities were personal interest, self-improvement, and socializing. Further, students with low levels of sense of community were enrolled in the communities for reasons such as spending their free time, gaining an environment, setting an example for young people, following current events, and increasing their cultural level. This might be attributed to the fact that the study participants belonged to different age groups and had different expectations. It is also observed that the expectations of some students were met but that of others were not, and that the general expectations of all students included gaining knowledge, establishing mutual interaction, and socializing. Students hold varying opinions on how the activities impact their learning process. Some of them stated that participating in the communities contributed to the learning process, whereas others stated that it did not. Further, the students added that learning new information contributed to their personal development. Only one of the students stated that participating in communities did not contribute to their personal development. This might be because students may find social activities related to their interests useful. On the other hand, students expressed the opportunity to learn from the field expert, the opportunity to watch the recording after the meeting, and the usefulness of the communities as positive experiences. Additionally, one student from the group of students with a low sense of community praised the consideration

and support shown through these social activities. However, another student from the same group noted that they were neglected. This feeling could be attributed to the insufficient environment for interaction with the moderator and fellow students. The inconvenience of the activity times and the fact that the activity program was not specified in advance were negative experiences for students with low levels of sense of community. All the interviewed students reported being insufficiently informed as a common negative experience. This is because each community makes announcements on its own special page. Hence, no common platform exists where announcements could be accessed through the e-Campus system without clicking on the community's page. On the contrary, students with high levels of sense of community stated that the communities were beneficial because they developed a sense of belonging, provided opportunities for personal development, and allowed graduates to continue to benefit from the system; however, they stated that the low number of events and the lack of interaction with students were negative experiences.

Students agreed that organizing more diverse activities, such as face-to-face meetings, events, and certified training programs, would help promote interaction. They also suggested that students be assigned specific tasks, that the number of online activities be increased, and that online interactive activities be promoted. It is noteworthy that students with low levels of sense of community have more suggestions. All students had the common suggestion of being informed via email or SMS. However, students with low levels of sense of community also had additional suggestions such as creating an announcement page, reminders, and a calendar, making social media announcements, and creating WhatsApp groups and YouTube advertisements. Similarly, although diversifying social media posts was a common suggestion from all students, those with low levels of sense of community also suggested creating community-specific social media channels and establishing WhatsApp or Telegram groups. Finally, the interviewed students stated that they had not formed lasting friendships within the communities due to the lack of a suitable interaction environment, which needs improvement.

Suggestions

The results of this study indicate the importance of diversifying activities, which could be achieved using both synchronous and asynchronous communication tools in online student communities. In addition to synchronous activities in learning communities, discussion forums or social media groups can serve as convenient venues where students can share their experiences and socialize asynchronously.

This study demonstrates that online student communities are effective tools for providing social support and enhancing the sense of community among students in open and distance learning environments. However, the study has some limitations. The data were collected from eight communities, and the analysis was conducted collectively. Consequently, all participants responded to a single questionnaire. In future studies, data could be collected separately, taking the type of community into account, as the level of sense of community experienced by a student may vary from one community to another. This variation could be influenced by factors such as personal motivation, the role of the community coordinator, discussion topics, and the presence of expert guests.

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(The Appendix follows overleaf)

	Completely agree	Agree	Disagree	Completely disagree
<i>Factor 1 concordance</i>				
1. Members in the online learning community have adopted me	(+)			
2. Being a member of this online learning community makes me feel good	(+)			
3. Participating in an online community is important to me	(+)			
4. I would like to participate in online learning communities in my other courses	(+)			
5. I am aware that members of the online learning community will contribute to my learning	(+)			
6. Studying with an online learning community allows me to see different perspectives	(+)			
7. I believe that members of the online learning community will support me when I need it	(+)			
8. I believe in the instructor's support for the online learning community	(+)			
9. I believe that learning with an online learning community will contribute to my learning	(+)			
10. Participating in an online learning community increases my confidence in participating in course discussions	(+)			
11. Discussing with the online learning community helps me consolidate the course topics better	(+)			
12. I believe that my learning skills have improved thanks to the online learning community	(+)			
13. The online learning community makes me more willing to participate in learning activities	(+)			
14. Participating in an online learning community improves my ability to study together with community members	(+)			
<i>Factor 2 independence</i>				
15. I feel uncomfortable in an online learning community	(-)			
16. What members of the online learning community think about me is not important	(-)			
17. I feel that I am not contributing to the learning of members of the online learning community	(-)			
18. I hesitate to ask questions to members of an online learning community	(-)			
19. I feel alone in an online learning community	(-)			

Table A1.
Online sense of
community index-2

(continued)

	Completely agree	Agree	Disagree	Completely disagree
20. Participating in an online learning community does not encourage me to learn	(-)			
21. I do not think about sharing the problems I encounter in the online learning community with other members	(-)			
22. I believe that online learning community members cannot fulfill their responsibilities	(-)			
23. I think that the learning environment does not have a positive effect on the formation of a sense of online learning community	(-)			
24. I think that the feedback given by the instructor to the online learning community is not useful	(-)			
25. Studying with an online learning community does not improve my communication skills	(-)			
<i>Factor 3 similarity</i>				
26. I think that members of an online learning community should have similar background experiences (social, cultural, academic, etc.)	(+)			
27. Members of an online learning community should have similar learning expectations	(+)			
28. I individually know most of the members participating in the online learning community	(+)			

Source(s): Gökçearslan (2013)

Table A1.

	Completely agree	Agree	Not sure	Disagree	Completely disagree
<i>Factor 1 co-presence</i>					
1. I think that other students are aware of my presence					
2. I feel like I am studying with other students					
3. I am interested in what other students are doing					
4. I think other students are interested in what I am doing					
5. The level of mutual interest seems high					
<i>Factor 2 influence</i>					
6. I think I can convey my ideas clearly to other students					
7. Other students understand me well					
8. I think I can understand well what other students think					
9. We accept each other's ideas well					
10. Other students' ideas affect what I think					
11. We help each other solve difficult problems					
12. We help each other					
<i>Factor 3 cohesiveness</i>					
13. It is pleasant to exchange ideas with other students					
14. I get quick responses from other students					
15. I feel comfortable communicating with other students					
16. My ideas help us proceed with group work					
17. All the team members contribute to group work					
18. I feel close to other students					
19. I feel like I am part of a team					
Table A2. Social presence scale	Source(s): Olpak and Kılıç Çakmak (2009)				

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