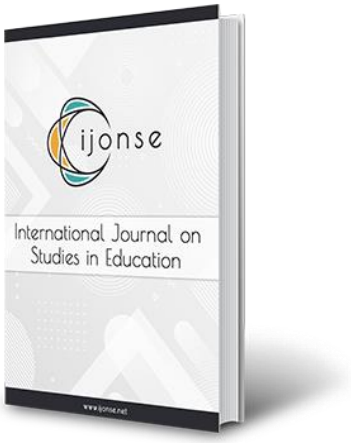

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Beyond the Screen: Socio-Virtualization in Online Higher Education

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To cite this article:

Fayda-Kinik, F.S. (2024). Beyond the screen: Socio-virtualization in online higher education. *International Journal on Studies in Education (IJonSE), 6*(3), 333-344. https://doi.org/10.46328/ijonse.225

International Journal on Studies in Education

2024, Vol. 6, No. 3, 333-344 https://doi.org/10.46328/ijonse.225

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Article Info

Article History

Received:
01 December 2023
Accepted:
15 May 2024

Keywords

Socio-virtualization
Online learning
E-learners
Higher education

Abstract

This study aims to explore the perception of socio-virtualization among e-learners in online higher education in terms of negativity in communication (NC) and social attention in virtualization (SAV) with the investigation of the relationship between demographic variables, satisfaction with online courses, and use of the internet with their perception of socio-virtualization. A quantitative research design was employed, and the sample of this study consisted of 427 e-learners who were taking online courses at different faculties of different Turkish universities across the country. The results of descriptive analyses indicated that e-learners' overall perception of socio-virtualization was detected as moderate. While their NC perceptions were identified as high, their SAV perceptions were also found as moderate. Moreover, significant variations in their perceptions of socio-virtualization were observed across different demographic variables such as gender and internet usage habits. This study contributes to the understanding of the socio-virtualization process in online higher education and its implications are beneficial for designing effective virtual learning environments.

Introduction

Educational experiences in online higher education have undergone a significant shift that revolves around ecosystems wherein virtual environments play a central role for all stakeholders involved. These environments serve as dynamic platforms where students, instructors, administrators, and other stakeholders engage in various aspects of teaching, learning, collaboration, and administration. In this respect, undergraduate students as e-learners have become active participants in shaping their learning experiences. They navigate through virtual classrooms, interact with peers and instructors, access learning materials, and contribute to discussions and collaborative projects within the virtual ecosystem of online higher education. For example, the rise of Massive Open Online Courses (MOOCs) has further contributed to the virtualization of higher education by offering free and accessible online courses to a wide audience (Galán et al., 2019). This socio-virtual transition not only expands access to education but also reshapes traditional notions of learning spaces. Socio-virtualization is a significant indicator of emerging differences influenced by virtual environments along with reduced face-to-face interaction in society during the socialization process (Korkmaz et al., 2014). Socio-virtualization refers to the social interactions, communication patterns, and sense of community that occur in virtual or online environments. The process of socio-virtualization within the educational setting entails fostering social interactions and

community bonds within a virtual space. Mitra (2023) claimed that social interactions can be maintained if virtual environments are utilized to facilitate interactions between individuals in both real-life and virtual contexts, rather than serving as a replacement for such interactions. Accordingly, the implications of socio-virtualization in online higher education are multifaceted and have the potential to reshape the way students perceive and engage in the learning process.

Through a variety of digital platforms, online education has cultivated a virtual community learning environment, which enables students to virtually interact and collaborate with both their peers and instructors (Dereshiwsky, 2021; Herrera Mateus et al., 2022; Peltier et al., 2003). This kind of virtual community facilitates peer collaboration, idea/information sharing, and mutual learning regardless of geographic boundaries, offers opportunities for reflective learning, and embraces a sociocultural approach to education (Nehme, 2008). However, it is important to note that socio-virtualization in online higher education is not without its challenges. One particular challenge is the prevalence of negative communication in virtualization (Bawa, 2016; Korkmaz et al., 2014). Negative communication in virtualization refers to any form of communication that is detrimental to the learning experience such as cyberbullying, trolling, or the spreading of misinformation. Another issue is social attention in virtual settings, which refers to the level of focus and engagement that individuals give to social interactions and community building in the online learning environment and is increasingly directed towards socio-virtualization in these regards (Korkmaz et al., 2014). Overall, virtualization has both positive and negative effects on communication and social attention and necessitates the development of tools and mechanisms to regulate and enhance virtual interactions.

Consequently, understanding e-learners' perception of socio-virtualization is essential for creating effective online learning environments within the context of higher education (Panigrahi et al., 2018). Thus, this study aims to explore the perception of socio-virtualization among e-learners in online higher education particularly regarding negativity in communication (NC) and social attention in virtualization (SAV). It also investigates the relationship between demographic variables, satisfaction with online courses, and use of the internet with e-learners' perception of socio-virtualization. The results of this study contribute to the broader understanding of how socio-virtualization influences online learning experiences and the design of more supportive and engaging virtual learning environments in online higher education. Additionally, insights gained from this study can aid higher education institutions in developing targeted interventions and strategies to mitigate negative aspects of socio-virtualization while maximizing its benefits for e-learners. Ultimately, this research aims to enhance the quality and effectiveness of online learning environments in higher education by depicting e-learners' changing perceptions of socio-virtualization in their digitally-surrounded communities, which can support educators, administrators, and policymakers about the dynamics in online learning settings. It can help them design more tailored and responsive approaches to curriculum development, teaching methodologies, and support services.

Method

Research Design

This study explored the perception of socio-virtualization among e-learners in online higher education in terms of

NC and SAV with the investigation of the relationship of demographic variables, satisfaction with online courses, and use of the internet with their perception of socio-virtualization. Hence, the following research questions (RQs) were examined:

RQ1: How do e-learners perceive socio-virtualization in online higher education?

RQ2: Does the e-learners' perception of socio-virtualization vary by demographic variables?

RQ3: Does the e-learners' perception of socio-virtualization vary by their satisfaction with online classes?

RQ4: Does the e-learners' perception of socio-virtualization vary by use of the internet?

Based on these RQs, a quantitative research design was created in this study, and the research framework is illustrated in Figure 1.

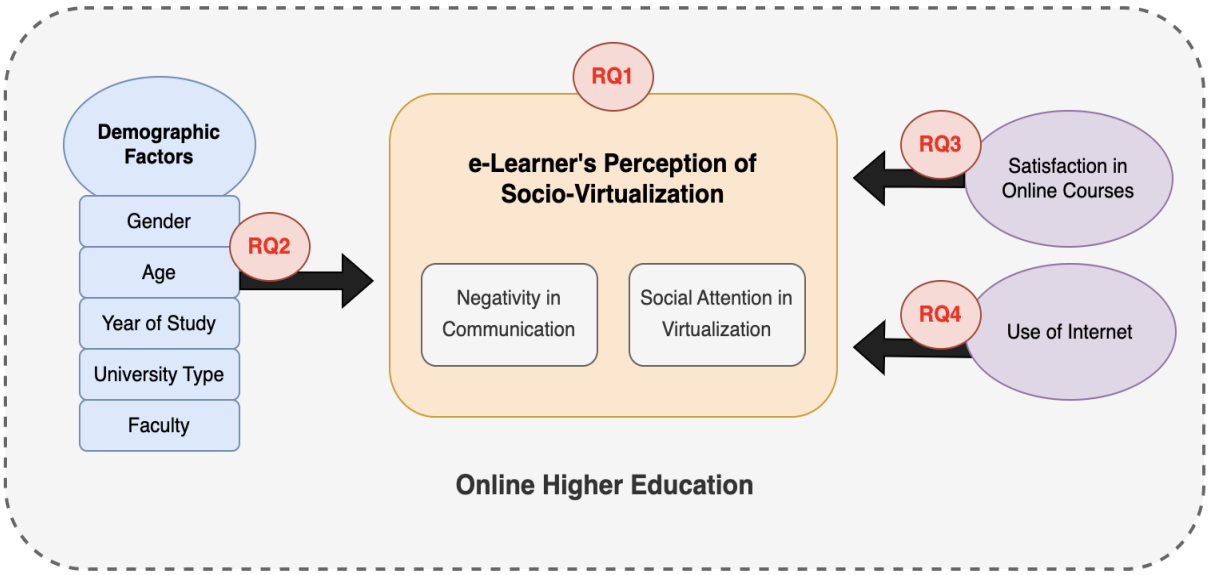

Figure 1. Research Framework

As designed, first, e-learners' perception of socio-virtualization was investigated along with the subscales of NC and SAV (RQ1). Second, the relationship between e-learners' perception of socio-virtualization and demographic variables was examined including gender, age, year of study, university type, and faculty (RQ2). Next, the relationship between e-learners' perception of socio-virtualization and their satisfaction with online courses was studied (RQ3). Finally, the relationship between e-learners' perception of socio-virtualization and their habits of internet use was investigated quantitatively (RQ4).

Participants

The sample of this study consisted of 427 e-learners who were taking online courses at different faculties of different Turkish universities across the country. The results of descriptive analyses for e-learner characteristics are presented in Table 1. Accordingly, 71.4% (n=305) were female e-learners whereas 28.6% (n=122) were male. The average age of the participants was 22.26 years. When the distribution of the year of study was analyzed,

first-year students constituted the largest group (34.7%; n=148), second-year students were represented by 27.9% (n=119), third-year students by 18.0% (n=77), fourth-year students by 15.0% (n=64), and fifth-year-or-above students by 4.4% (n=19). The majority of the participants (93.2%; n=398) were studying at state universities while the remaining 6.8% (n=29) were at foundation universities. The average number of online courses taken by the respondents was 8.76 in the 2020-2021 academic year, decreased to 6.12 in 2021-2022, and dramatically increased to 9.60 in 2022-2023. In terms of faculty preferences, it was revealed that 26.90% of the respondents were studying at the faculty of health sciences (n=115), 18.00% (n=77) at the faculty of education, 16.90% (n=72) at the faculty of engineering, 10.30% (n=44) each at the faculty of economics and administrative sciences and the faculty of arts and sciences, 5.90% (n=25) at the faculty of theology, 4.70% (n=20) at the faculty of fine arts, 3.30% (n=14) at the faculty of law, 2.30% (n=10) at the faculty of business administration, and 1.40% (n=6) at the faculty of communication.

Table 1. Characteristics of e-Learners

Gender	*n*	*%*
Male	122	28.6
Female	305	71.4
Age	$\bar{X}$	*SD*
	22.26	3.936
Year of Study	*n*	*%*
1st year	148	34.7
2nd year	119	27.9
3rd year	77	18.0
4th year	64	15.0
5th year or more	19	4.4
University Type	*n*	*%*
State	398	93.2
Foundation	29	6.8

Online Course Experience	$\bar{X}$	*SD*
No. of Online Courses in 2020-2021	8.76	8.416
No. of Online Courses in 2021-2022	6.12	8.601
No. of Online Courses in 2022-2023	9.60	17.148
Faculty of …	*n*	*%*
Health Sciences	115	26.90
Education	77	18.00
Engineering	72	16.90
Economics and Administrative Sciences	44	10.30
Science and Letters	44	10.30
Theology	25	5.90
Fine Arts	20	4.70
Law	14	3.30
Management	10	2.30
Communication	6	1.40
Total	427	100

Research Instruments

The tools used in this study were constructed as a questionnaire form including two sections: demographics and background, and the "Socio-Virtualization Perception Scale" (SVPS) developed by Korkmaz et al. (2014). In the first section, demographic variables were requested from the participants such as gender, age, year of study, university type, and faculty in addition to the question items focusing on e-learners' satisfaction with online courses and their habits of internet use. In the second section, SVPS was formed in 14 items including two subscales of NC and SAV with a five-point Likert-type scale. The normality and reliability of SVPS were measured on SPSS for Windows v27.0 package program. When kurtosis and skewness values were calculated to determine whether the dimensions meet the assumption of normal distribution, they were found between -2 and

+2. In this context, concerning the NC subscale, the skewness value was -0.503, and the kurtosis value was -0.165. For the SAV subscale, the skewness value was detected as 0.203, and the kurtosis value was -0.595. As a result, all these values met the assumption of normal distribution for the use of parametric tests (George & Mallery, 2010). Regarding the SVPS reliability, the Cronbach's Alpha coefficient was found greater than 0.700 (α_{NC}=0.876; α_{SAV}=0.848), which shows that the data obtained are reliable (Gliem & Gliem, 2003; Taber, 2018).

Data Collection

The Board of Ethics for Human Studies in Social Sciences and Humanities granted its approval before the data were collected by ensuring that the study complied with ethical and scientific standards. The questionnaire form was configured on an online platform, and over 700 e-learners enrolled in online courses at various Turkish universities were given access to the research tool. 427 valid responses were used for the analyses after the participants issued their consent to be included in the study.

Data Analysis

Implemented as a quantitative study, this research utilized statistical analyses conducted through the SPSS for Windows v27.0 software package. In this study, the initial step involved conducting descriptive analyses for demographic variables to provide an overview of the sample characteristics. Following this, the normality assumption was checked to determine the appropriate analytical approach for the data.

Subsequently, the reliability of the measurement instrument was assessed by calculating Cronbach's Alpha coefficients for the subscales of SVPS. Following these steps, the e-learners' perception of socio-virtualization was investigated for its relationship with demographic variables and their habits of internet use. Accordingly, independent sample t tests were employed for variables with two groups such as gender, age, and university type while ANOVA was performed for variables with more than two groups such as year of study and faculty.

Results

Socio-Virtualization Among E-Learners in Online Higher Education

The results of descriptive analyses indicated that e-learners' overall perception of socio-virtualization was detected as moderate with a mean score of 3.345 ($2.61 < \bar{X} < 3.40$), and the results for the subscales of SVPS are listed in Table 2 (RQ1).

Table 2. Descriptive Statistics for SVPS

SVPS	$\bar{X}$*	*S.D.*
Overall Level of SVPS Perception	3.345	0.654
Negativity in Communication	3.878	0.701
Social Attention in Virtualization	2.812	0.978

*1.00-1.80: very low; 1.81-2.60: low; 2.61-3.40: moderate; 3.41-4.20: high; 4.21-5.00: very high

As observed in Table 2, the participants' NC perceptions were high with a mean score of 3.878 ± 0.701 ($3.41< \bar{X} < 4.20$), and their SAV perceptions were identified as moderate with a score of 2.812 ± 0.978 ($2.61 < \bar{X} < 3.40$).

Variability of E-Learners' Perception of Socio-Virtualization by Demographic Variables

The relationship between e-learners' perception of socio-virtualization and demographic variables was analyzed including gender, age, year of study, university type, and faculty (RQ2). First, the gender-related relationship was investigated, and the findings of the independent sample t test used to examine the variability of students' socio-virtualization perception by gender are depicted in Table 3. The subscales of NC and SAV differed according to gender ($p_{NC}=0.015$; $p_{SAV}=0.003$; $p<0.05$). In other words, women's perceptions of negativity in communication were higher than male e-learners while men's perceptions of social attention in virtualization were detected as higher than women.

Table 3. Variability of e-Learners' Perception of Socio-Virtualization by Gender

SVPS	Male (n=122)	Female (n=305)	*t*	*p*
Negativity in Communication	3.745 ± 0.716	3.932 ± 0.688	-2.462	0.015
Social Attention in Virtualization	3.031 ± 0.969	2.724 ± 0.969	2.959	0.003

Second, the relationship between e-learners' perception of socio-virtualization and age was investigated through the independent sample t test. Two groups in the sample were formulated by accepting the value of average age as the limit value ($\bar{X}=22.26$) to use independent samples t test, and the results are demonstrated in Table 4. No significant difference was found in both NC and SAV by average age ($p_{NC}=0.066$; $p_{SAV}=0.746$; $p>0.05$).

Table 4. Variability of e-Learners' Perception of Socio-Virtualization by Age

SVPS	Above Average (n=129)	Below Average (n=298)	*t*	*p*
Negativity in Communication	3.971 ± 0.664	3.839 ± 0.713	1.845	0.066
Social Attention in Virtualization	2.788 ± 1.033	2.822 ± 0.955	-0.325	0.746

Next, the variability of e-learners' perception of socio-virtualization between students at different years of study was analyzed through ANOVA. The ANOVA findings are presented in Table 5. Accordingly, it was observed that the perceptions of NC and SAV did not differ by year of study ($p_{NC}=0.393$; $p_{SAV}=0.181$; $p>0.05$)

Table 5. Variability of e-Learners' Perception of Socio-Virtualization by Year of Study

Year of Study	*n*	*Negativity in Communication*	*Social Attention in Virtualization*
1st year	148	3.829 ± 0.713	2.839 ± 0.984
2nd year	119	3.847 ± 0.728	2.808 ± 0.980
3rd year	77	3.877 ± 0.679	2.738 ± 0.910
4th year	64	4.023 ± 0.638	2.856 ± 1.048
5th year or more	19	3.982 ± 0.713	2.768 ± 1.020
F(p)		1.028 (0.393)	0.181 (0.948)

Subsequently, the variability of e-learners' perception of socio-virtualization according to university type was examined through the independent sample t test. The related findings are demonstrated in Table 6, and no statistically significant difference was found in both NC and SAV by university type they were studying (p_{NC}=0.085; p_{SAV}=0.315; p>0.05).

Table 6. Variability of e-Learners' Perception of Socio-Virtualization by University Type

SVPS	State (n=398)	Foundation (n=29)	*t*	*p*
Negativity in Communication	3.895 ± 0.698	3.651 ± 0.715	1.775	0.085
Social Attention in Virtualization	2.824 ± 0.981	2.641 ± 0.926	1.021	0.315

Finally, the variability of e-learners' perception of socio-virtualization between e-learners at different faculties was investigated through ANOVA as indicated in Table 7. Consequently, it was identified that the perceptions of NC and SAV did not differ by faculty where e-learners were studying (p_{NC}=0.095; p_{SAV}=0.878; p>0.05).

Table 7. Variability of e-Learners' Perception of Socio-Virtualization by Faculty

Faculty	*n*	*Negativity in Communication*	*Social Attention in Virtualization*
Health Sciences	115	3.895 ± 0.691	2.791 ± 0.959
Education	77	3.885 ± 0.702	2.891 ± 0.961
Engineering	72	3.687 ± 0.712	2.819 ± 0.919
Economics and Administrative Sciences	44	4.043 ± 0.693	2.714 ± 0.929
Science and Letters	44	3.788 ± 0.715	2.682 ± 0.941
Fine Arts	20	4.061 ± 0.726	2.970 ± 1.335
Others	55	3.962 ± 0.658	2.858 ± 1.062
F (p)		1.812 (0.095)	0.401 (0.878)

Variability of E-Learners' Perception of Socio-Virtualization by Satisfaction with Online Courses

The relationship between e-learners' perception of socio-virtualization and their satisfaction with online courses was investigated through the independent sample t test (RQ3). Two groups of satisfaction were formed in order to use an independent sample t test by accepting the average satisfaction as the limit value ($\bar{X}$=3.14; SD=1.123). The findings are listed in Table 8.

Table 8. Variability of e-Learners' Perception of Socio-Virtualization by Their Satisfaction with Online Courses

SVPS	Above Average (n=164)	Below Average (n=263)	*t*	*p*
Negativity in Communication	3.843 ± 0.750	3.900 ± 0.668	-0.793	0.428
Social Attention in Virtualization	2.778 ± 1.003	2.832 ± 0.962	-0.556	0.579

As observed in Table 8, no statistically significant difference was found in both NC and SAV by e-learners' satisfaction with online courses (p_{NC}=0.428; p_{SAV}=0.579; p>0.05).

Variability of E-Learners' Perception of Socio-Virtualization by Use of Internet

The relationship between e-learners' perception of socio-virtualization and their habits of internet use was analyzed into two parts: daily usage of the internet for general and educational purposes (RQ4). First, the independent sample t test was performed to examine the variability in e-learners' perception of socio-virtualization according to average daily usage of the internet for general purposes. Therefore, two groups were formed to use the independent sample t test by accepting the average daily usage of the internet as the limit value, and the findings are demonstrated in Table 9. Accordingly, no significant difference was found in the perception of NC according to average daily usage of the internet for general purposes (p_{NC}=0.387; p>0.05). However, it was observed that e-learners' perception of SAV with higher-than-average daily internet use was detected significantly higher than the participants with lower-than-average daily internet use (p_{SAV}=0.025; p<0.05).

Table 9. Variability of e-Learners' Perception of Socio-Virtualization by Their Average Daily Usage of Internet for General Purposes

SVPS	Above Average (n=159)	Below Average (n=268)	*t*	*p*
Negativity in Communication	3.916 ± 0.677	3.856 ± 0.715	0.867	0.387
Social Attention in Virtualization	2.948 ± 0.960	2.731 ± 0.981	2.248	0.025

Subsequently, the variability of e-learners' perception of socio-virtualization by average daily usage of the internet for educational purposes was examined through the independent sample t test after two groups were created to perform the analysis by accepting the average daily usage of the internet for educational purposes as the limit value, and the findings are demonstrated in Table 10.

Table 10. Variability of e-Learners' Perception of Socio-Virtualization by Their Average Daily Usage of Internet for Educational Purposes

SVPS	Above Average (n=126)	Below Average (n=301)	*t*	*p*
Negativity in Communication	3.860 ± 0.715	3.886 ± 0.696	-0.352	0.725
Social Attention in Virtualization	2.889 ± 1.033	2.779 ± 0.953	1.021	0.308

As indicated in Table 10, no statistically significant difference was found in both NC and SAV by e-learners' average daily usage of the internet for educational purposes (p_{NC}=0.725; p_{SAV}=0.308; p>0.05).

Discussion

Socio-virtualization, as a significant indicator for influencing e-learners' attitudes and behaviors, was investigated comprehensively in this quantitatively designed research along with its relationship with demographic variables, satisfaction with online courses, and internet usage habits. First, it was revealed that e-learners' overall perception of socio-virtualization was detected as moderate; additionally, their NC perceptions were detected as high whereas their SAV perceptions were found as moderate similar to the overall level of socio-virtualization. Consistently, Mukhametdinova et al., (2022), in their study to reveal the socio-psychological aspects of how university students

perceive distance learning, noted the importance of the lack of "live" communication in distance learning. Wang (2023), in a study focusing on students' mental health during distance learning, suggested that first-year students may find distance learning less effective compared to fourth-year students due to challenges in adapting to a new social environment and establishing trusting relationships with peers and instructors. Similarly, Mohammed (2023) indicated that the development of a sense of community in the online environment was found as the main difficulty in e-learning. Based on the existing literature (Price & Weston, 2023), e-learners' perceptions of communication and social attention are negatively affected by online learning environments.

Regarding the variability of e-learners' perception of socio-virtualization by demographic variables, only a gender-related relationship was confirmed in this study. Accordingly, women's NC perceptions were identified as higher than male e-learners; on the other hand, men's SAV perceptions were detected as higher than women's. Consistently, Vate-U-Lan and Masouras (2018) surveyed online students' attitudes toward e-learning communication and detected gender differences in attitudes toward social network sites. Similarly, Tanti et al. (2022) examined gender differences in students' perceptions of e-modules and found significant differences between male and female students' perceptions. Furthermore, the examination of the variability in e-learners' perception of socio-virtualization based on their satisfaction with online courses revealed no statistically significant difference in either NC or SAV. This result suggests that while satisfaction with online courses is an important factor in the overall e-learning experience, it may not directly influence how learners perceive and engage in socio-virtualization within virtual learning environments.

Finally, the relationship between e-learners' perception of socio-virtualization and their internet usage habits was examined by considering both general and educational purposes. The analysis confirmed that e-learners who reported higher-than-average daily internet use exhibited a significantly higher perception of SAV compared to those with lower-than-average daily internet use for general purposes. This finding implies that e-learners who engage in higher levels of general internet usage tend to perceive greater social attention within virtual learning environments, which indicates that individuals who are more active online may feel a stronger sense of social presence and interaction in their virtual learning experiences. Consistently, this aligns with the existing literature highlighting the importance of social presence in online contexts and its positive effects on learners' success, satisfaction, and performance (Bromer et al., 2021; Pham et al., 2023). In other words, individuals' familiarity with digital platforms and their comfort level in navigating online social dynamics can be essential indicators for SAV. Therefore, e-learners' internet usage habits should be considered when designing and implementing virtual learning environments to optimize social engagement and interaction. However, no statistically significant difference was observed in either NC or SAV according to e-learners' average daily usage of the internet for educational purposes. In short, e-learners' average daily usage of the internet for educational purposes does not significantly impact their perception of negative communication or social attention within virtual learning environments.

Conclusion

Socio-virtualization in the educational context involves nurturing social interactions and building community

connections within a digital environment. This study offers a comprehensive investigation into the socio-virtualization of online learning environments and its relationship with various factors such as demographic variables, satisfaction with online courses, and internet usage habits. Overall, this research contributes valuable insights into the complex nature of socio-virtualization in online education by offering implications for enhancing the design and implementation of effective virtual learning environments. For future research, it is essential to consider a multifaceted approach that encompasses not only internet usage patterns but also individual characteristics, course design, and technological factors to optimize the effectiveness of virtual learning environments. By further exploring these dimensions, educators and practitioners can tailor online learning experiences to better meet the diverse needs and preferences of e-learners by ultimately enhancing the quality and impact of online education in higher education settings.

Recommendations

In light of the findings on socio-virtualization within online learning environments, policymakers in higher education institutions should prioritize initiatives for enhancing digital literacy and social skills development among students. Integration of digital citizenship and online communication training can be recommended into curricula to equip learners with the necessary skills to navigate virtual environments effectively. From a practical standpoint, higher education institutions and practitioners should prioritize the design and implementation of virtual learning environments improving social interaction and community-building. Incorporation of collaborative learning activities, discussion forums, and group projects into online courses can facilitate peer interaction and engagement. Moreover, educators should leverage technology to create opportunities for personalized learning experiences that cater to the diverse needs and preferences of e-learners. Additionally, ongoing professional development and training for instructors are essential to ensure they are equipped with the pedagogical skills and technological know-how to effectively facilitate socio-virtualization in online education. By adopting these recommendations, more inclusive, engaging, and effective online learning environments can be created to promote student success and satisfaction.

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