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Interest and motivation of disadvantaged students toward online learning during the COVID-19 pandemic in Nepal

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Online learning and teaching during the COVID-19 pandemic had mixed impacts on students' accessibility and performance. It benefited the concerned stakeholders, including management, teachers, and the students, to retain in the system, but it reinforced pre-existing discrimination among students from various disadvantaged groups. Studies reveal that the online learning system created an environment that facilitated students' motive and interest in learning who disengaged themselves from classrooms due to various socioeconomic reasons during the pandemic. The present study explored students' experience and perception of online learning in Nepal and analyzed the predictors of their interest in participating in the new learning environments. More specifically, it studied how the online modes of learning were associated with the interests of disadvantaged higher education students in their academic pursuits during the COVID-19 pandemic and how online learning impacted the pre-existing discrimination among them. The study generated concepts and variables drawing from the technology acceptance model (TAM) and a review of existing literature. A survey among 324 higher education students and a follow-up interview among nine selected respondents were conducted in Nepal between April and June 2021. The sample represented students from all social classes, genders, financial status, and geographies. Using a logistic regression model of the survey data and thematic analysis of interviews, this study found that compared to others, students from disadvantaged groups were significantly motivated by the online learning system. Their perception of online learning was positive despite the shortcomings of the system, such as the lack of internet infrastructure and the continuous flow of electricity. Students' motivation toward the online learning system was triggered by their perception, which helped them to retain and continue in the higher education system. Based on the findings, this study concludes that in a developing country like Nepal, where students face social, economic, and geographical challenges in accessing higher education, the online learning system could be an effective alternative to traditional face-to-face learning to minimize pre-existing discrimination.

KEYWORDS

COVID-19, disadvantaged students, online learning, higher education (HE), Nepal, technology acceptance

Background

The education sector responded to the COVID-19 pandemic by shifting teaching and learning from in-person to online. This shift has been an expansion and continuation of the pre-existing distance learning system in some advanced countries like Australia and the United States (Schleicher, 2020). While in most countries across the world, especially in developing countries, the change was sudden and therefore 'unplanned' (El Said, 2021), which consequently challenged the effective participation of the concerned stakeholders, including students. The rate of adoption of the new technology varied between the advanced and emerging economies because they had varying degrees of differences in technical and financial capacities in order to handle the new system (Schleicher, 2020). Researchers attribute the increasing application of new technology in the education system to deepening globalization (Archibugi and Michie, 1995; Brown, 1999; Islam et al., 2015). The COVID-19 pandemic further spurred debates and discussions on the inevitability and effectiveness of online learning on both sides of the world. However, there are limited studies on how the new learning mode influences students' motivation to apply it to pursue their interests in higher education. This study tries to fill this research gap using the case study of Nepal.

The online learning system is a mode of teaching and learning that uses electronic devices to target distant learners. Unlike the traditional classroom-based face-to-face learning mode, the new system provides students with a relatively free and flexible environment to interact with educational institutions and access educational resources. In addition to ensuring access to education, it fosters quality of teaching and learning, maintains competitive advantages of educational institutions (Islam et al., 2015), and reduces students' cost of education (Songkram, 2015). Multimedia application is the best option in this system.

Known also as distance learning (DL), e-learning, and sometimes online distance learning (ODL), online learning is designed to serve off-campus populations (Hannay and Newvine, 2006). This new learning system is supposed to facilitate the interest of the population who unwillingly disengage from education due to economic, social, and geographic reasons (Al Rawashdeh et al., 2021; Maatuk et al., 2021). In higher education (HE), it provides access for students who cannot attend traditional courses due to employment, cost, geographic distance, and social conditions (Hannay and Newvine, 2006). In the context of a developing country, social marginalization, such as so-called caste, poverty, and gender, is also minimized by online education (Khan and Williams, 2006). However, the COVID-19 pandemic exacerbated social marginalization, leaving people off-campus and limiting access to in-person education. Such trends have significantly hampered the attainment of Sustainable Development Goals, which commit to eliminating educational discrimination for all by 2030 (UNESCO, 2022). Given the applicability of the online learning system, it could be useful to meet the global objectives by ensuring access and triggering motivation and interest among disadvantaged students in learning. The term 'disadvantaged' in general includes people from lower castes, ethnic minorities, and females. In this study, we define disadvantaged groups of students as those who are unable to attend courses physically in classrooms due to distance, cost of education, family commitments, and jobs.

Recent studies on the implications of online learning for students reveal contrasting findings. One of the major concerns is that the pandemic reinforced the pre-existing social, economic, and spatial discriminations among disadvantaged students in higher education. Arguments assert that students who fall into disadvantaged groups have historically been facing discrimination by the education systems. Studies show that various factors disengage people from the mainstream and cause discrimination, including perception about race (Museus et al., 2015), economic characterization (Grodsky and Jones, 2007), and sociocultural beliefs (Subba, 2019). In India, only one-third of the eligible population in the 17–29 years age group participated in higher education in 2010 (Basant and Gitanjali, 2014), with sharp variations between rural and urban areas (Shariff and Sharma, 2013), male and female students, and privileged and disadvantaged groups (Tilak, 2015). The Chinese situation is predominant, with a geographic variation. According to Zhao (2019), rural–urban divide and inter-provincial variations caused sharp inequality in students' enrollment, completion, and academic achievement in pursuing higher education. Hongbin et al. (2013) found that youth who live in rural China were seven times less likely to attend university than those from urban areas. In South Africa, race, color (Gore and Botha, 2022), and economic and spatial factors (Villers, 2012) are major determinants of educational accessibility. In Botswana and Zambia, geographic distance, financial pressure, and social challenges are major impediments to accessing higher education (Mphahlele et al., 2021). Salto (2020) concerns about unequal internet service distribution and the digital divide in Latin American countries regarding education accessibility. The online learning system during COVID-19 further aggravated these discriminations (Abbasi et al., 2020; Miranda Pinto, 2020; Devkota, 2021; Muthuprasad et al., 2021; Harefa and Sihombing, 2022; Nayak and Alam, 2022). Limited studies in the existing body of literature highlight the online learning system as a cue to increase access and ignite learning interests among diverse groups. Previous studies generalize the COVID-19 impact and fail to examine the significance of online learning technologies when disruptive events such as the pandemic breach the existing educational system. The COVID-19 pandemic is a temporary phenomenon, whereas students dropping out, inaccessibility, and being off-campus are enduring across regions, countries, and times. Studies show that even in the pre- and post-pandemic periods, students faced difficulties to retain in the education.

Drawing from higher education students' experiences in Nepal, this study examines disadvantaged students' motivations toward the new learning system. It also assesses factors associated with students' selection of the new learning mode. In the next section, a brief review of the empirical literature is given, followed by the methods and materials of the study, results and discussion, and conclusion.

Literature review

In this section, empirical literature concerning students' motivation, interest, and access to higher education during the pre-pandemic and pandemic periods is examined. It begins with the general introduction of the technology acceptance model [TAM] (Davis, 1989) as the theoretical base of this research. As the general studies tend to show that the online mode of learning bridges the classroom–student gaps, the review particularly focused on disadvantaged students' experience and factors associated with the selection of an online learning system.

Technology acceptance model (TAM)

User's acceptance and use of technology are well explained by Davis (1989). The technology acceptance model is an information theory that explains how people are motivated to use technology. It explains that people's adoption of computer technology and its use are influenced by their behavioral intentions and attitudes. Attitude is determined by perceived usefulness and comfort. Davis (1989) identified that two major factors determine whether users accept or reject new information technology. They are perceived usefulness and perceived ease of use. Perceived usefulness is users' belief that the innovation will help them to perform their jobs better. Perceived ease of use is defined as the easiness of its application. The lower the effort to handle technology results in higher the ease of its use. According to Davis (1989), a number of factors influence user's perceived usefulness and ease of use. Performance, user's motivation, access cost, compatibility, relative advantage, convenience, unburdensomeness, controllability, time-saving, productivity, and effectiveness are among those factors. The theory also considers external factors such as social influence, personal characteristics, and environmental contexts that affect users' perception of usefulness and ease of use. In this study, these key determinants are applied to derive hypotheses.

Applying the technology acceptance model (TAM), Pedrotti and Nistor (2016), Pan (2020), and Yan et al. (2022) found that learners who perceived an online education platform as useful and easy to use have higher intrinsic and extrinsic motivations to use it, which in turn led to better learning performance and satisfaction. Thus, these studies suggest that learners' motivation can be mediated through technology to ensure online learning outcomes.

Access to higher education during the COVID-19 pandemic

Students' access to HE during the COVID-19 pandemic revealed a contrasting trend of online learning compared to previous findings because COVID-19 exacerbated hidden inequalities and disparities in online learning. In India, the COVID-19 pandemic amplified pre-existing access inequalities in HE for girls, rural students, and marginalized groups (Nayak and Alam, 2022). They faced time management constraints, technological access, and a lack of infrastructure (Roy and Brown, 2022). Students from rural areas faced additional challenges during the pandemic (Muthuprasad et al., 2021). In Brazil, students from poor areas did not have access to the new technologies in public universities, and they were unable to pay the tuition fees in private universities during COVID-19 (Miranda Pinto, 2020). In Indonesia, students living in remote and rural areas were facing difficulties accessing the new learning system due to the absence of communication networks and internet infrastructures (Harefa and Sihombing, 2022). The same trends were noticed in Pakistan (Abbasi et al., 2020). In Jordan, the motivations and interests of students in online learning were impacting students' performance in online courses (Almahasees et al., 2021). Mphahlele et al. (2021) found significant disparities in access to and participation in technologies and educational opportunities in South Africa, Zambia, and Botswana. Digital access during COVID-19, as reported by Mphahlele et al. (2021), was affected by the financial inability to acquire technology at home. Stelitano et al. (2020) affirmed that students' engagement in higher education during the COVID-19 pandemic was affected by the disparities in internet access for poor households in rural areas. Ntombela (2021) mentioned that, among others, students with disabilities were gravely affected by the online learning system due to a lack of accommodation and support. Al-Maskari et al. (2021) found that higher education institutions (HEIs) and faculty support significantly motivated students' academic concerns in Sultanate, Oman. They found that the availability of resources, e.g., electricity, internet connection, and multimedia devices, affected students' interest in participating in online education.

Economic, sociocultural, and spatial factors affected the students' access to HE during the COVID-19 pandemic. Intermittent power supply, digital divide across regions, and technology costs were among the major factors. The literature provides a framework for arguing that the online teaching and learning system is incompatible with student's needs in higher education. More specifically, students from various disadvantaged groups experienced discrimination in the new system. Not many studies have attempted to look into the positive side of the spurring online learning systems during the COVID-19 pandemic that bridged the gap between education opportunities and conventionally disadvantaged students. With a case study of Nepal, this research strives to explore how the burst of online learning retained disadvantaged students in higher education during the COVID-19 pandemic.

Status of disadvantaged students in HE in Nepal

Nepal cannot be an exception to discrimination in higher education given its short history and highly centralized higher education system (Parajuli et al., 2007; Simkhada and Teijlingen, 2010; Devkota, 2021). A study conducted by Parajuli et al. (2007) found that women, Dalits (so-called 'lower caste' in the Nepalese social system), Janajatis (ethnic minorities), people from remote and rural areas, and, most importantly, the poor, have either very little or no access to higher education.

Gender disparity is rampant in the country. The ratio of girls' participation decreases as the level of education increases. The condition is not different for Janajatis, and it is even worse in the case of Dalits. The access is also determined by the economic status of the students. The higher the economic status of the people, the higher their access to higher education (Parajuli et al., 2007). Simkhada and Teijlingen (2010) mentioned that students from low-income families have significantly low participation in higher education. Asian Development Bank (ADB), one of the major funding agencies in Nepal's higher education, reported inequities in access for women, disadvantaged groups, remote areas, and geographies. It highlights that disparities between rural and urban areas are among the key issues in Nepali higher education (Asian Development Bank, 2015). In a recent study, Devkota (2021) argued that Nepal's higher education is historically 'occupied with social selection and elite and middle-class favoritism under the patronage of social, cultural, economic, and politico-ideological structures.' These factors determine the access of girls, Janajatis, Dalits, and students from remote areas in higher education. Subba (2019) asserted that girls' access to higher education in Nepal is historically constrained by the patriarchal, discriminatory belief system that claims education for girls is a mere luxury. Khanal

(2019) found higher dropout rate and irregularity among working students and students in disciplines like humanities and social sciences, as well as education and management. In terms of participation, the author found that higher portions (29.57%) of the male students were always irregular than the female students. Gandhari (2021) analyzes factors such as social discrimination, discrimination in academic institutions, economic constraints, and geographical remoteness as the hindrances to have equitable access to higher education in Nepal.

Despite their comprehensive coverage, the literature fails to suggest how learning discrimination among disadvantaged students can be minimized. The present study addresses this gap and explores the potentiality of online learning to augment students' access to higher education and learning motives.

Pandemic contexts

Nepal adopted the online learning mode of higher education at the end of March 2020. This was an unintentional shift aimed to compensate for the loss due to the first wave of the COVID-19 pandemic. As the spread slowed down in January 2021, the HEIs gradually started to open up the education sectors for continuing its traditional face-to-face modes. Unfortunately, after 3 months, the second wave of the pandemic erupted again, and for the second time, the national lockdown was enforced by the government. Hence, HEIs were obliged to adopt online learning mode for the second time to continue their education.

Very few studies focus on the pandemic's impact on students' access to higher education in Nepal. These studies reveal that students have mixed experiences with online learning. Overall, the studies tend to conclude that the COVID-19 pandemic reinforced the pre-existing access discrimination in Nepalese higher education for girls, Dalits, Janajatis, and students from rural areas. In one of the early studies, Dawadi et al. (2020) argued that equitable access to online learning for all students in Nepal is a huge challenge. The persistent digital divide, accompanied by unequal access to online learning resources, has further widened the gap among students with different socioeconomic and literacy backgrounds.

Acharya et al. (2021) conducted a cross-sectional study during COVID-19 and found that almost two-thirds of students (64.6%) were unsatisfied with the online classes, while 28.8% of total students experienced the new system as unappealing. However, factors such as age, hours spent online engagement, and period of educational work using e-resources were associated with students' satisfaction with the online learning mode. Gautam and Gautam (2021) found that most of the surveyed students (68%) were interested in participating in higher education through online learning. In a broad analysis of inequalities and inequities in Nepal's higher education, Devkota (2021) reveals that girls, students in rural HEIs, and marginalized groups (e.g., Dalits and Janajatis) were marred in access to higher education. The factors discussed in the study were the digital divide, social and cultural values, poverty, and ineffective internet infrastructures. Farid et al. (2021) admitted that educational opportunities had long been unequally distributed across genders, income groups, geographies, and other demographics, which were exacerbated during the pandemic by unequal socioeconomic conditions and limited technological infrastructure. Ghimire et al. (2021) used interpretative phenomenological analysis (IPA) and found that disadvantaged students were facing severe challenges while participating in online education due to lack of institutional preparedness, digital divide, lack of student support programs, and required infrastructure.

Studies in national and international contexts highlighted students' perceptions of online learning. There is a research gap on how the shift of learning from in-person to online led to interest and opportunities for certain segments of students. Given that disadvantaged students were historically deprived of education, we attempt to explore how they responded to the new learning system and analyze how beneficial the system was to them.

Methods and materials of the study

This study examined disadvantaged students' interest and motivation toward online learning systems during the COVID-19 pandemic in Nepal. A convergent parallel mixed method was adopted to measure the factors associated with students' interest and motivation. Past studies show that students have mixed experiences and reactions toward online learning modes. In this study, we included students who are socially and geographically vulnerable to access higher education. They are defined as disadvantaged students. The review of past studies above suggests that various factors determine students' access to higher education. The rural–urban divide is one of the geographical factors discussed by Hongbin et al. (2013). Mphahlele et al. (2021) discussed marriage, family size, and family commitments as sociocultural factors that concern girls and married students as determining factors of higher education attainments. Subba (2019) explored social and cultural perceptions of girls' impediments to retaining in higher education. Geographical distance and financial pressure have been found by Villers (2012) as factors associated with students' inaccessibility to education.

Among various factors discussed in the available literature, this study studied variation in interest toward online learning based on students' family sizes, marital statuses, employment situations, and their places of residence—rural and urban areas. Social sciences major students were included as a separate group in this study because the literature suggests they typically belong to financially and socially marginalized sections (Parajuli et al., 2007; Bhatta et al., 2008). Past studies have shown that disadvantaged students have historically faced challenges in pursuing higher education, and the trend continued during the COVID-19 pandemic (Parajuli et al., 2007; Devkota, 2021). Additionally, these factors are related to the pandemic context and system of online learning. During the COVID-19 pandemic, the nationwide lockdown limited students' mobility and forced them to remain at their homes. As universities commence online learning, there is a high probability that these groups of students will face issues with continuing classes because of a lack of internet infrastructure, time management, family obligations, and job commitments, among others, as revealed by the previous studies. This study hypothesizes that these groups of disadvantaged students got motivated toward online learning and thus retained in the education system during the COVID-19 pandemic. The following section details the hypotheses of the study.

Hypothesis of the study

This study argues that the online learning mode adopted by the HE institutions during the COVID-19 pandemic created multiple opportunities for the students to retain in the education. With the adoption of the new technology, students were motivated, which augmented their interest in learning. Researchers conjectured this because, despite some shortcomings, online learning has become a lifeline for the education system worldwide. Secondly, existing literature suggests that the new online learning system increased students' access to higher education (HE). Past studies have documented the impacts of COVID-19 on learning behaviors across all students (e.g., Middleton, 2020; Wyse et al., 2020; Patrinos et al., 2022).

Based on the theoretical model as well as the synthesis of literature reviews, this study sets the following hypotheses:

- Rural students' interest toward online learning would be higher than that of urban students.
- Girls would have greater interest in online learning than boys.
- Students with good internet infrastructures would have higher interest in online learning than students who do not.
- Social sciences major students would have higher interest in online learning than non-social science major students.
- Students with larger family size would have higher interest in online learning than students with smaller family size.
- Students with jobs would have greater interest in online learning than students without jobs.

Research context: brief description of HE in Nepal

Nepal has a century-long history of formal higher education. With eight students enrolled, the foundation of Tri-Chandra College in 1918 marked the first higher education institution in Nepal. Until 1951, when Nepal embarked on a modern democratic state after dethroning a century-old Rana's oligarchic regime, the country had only two undergraduate colleges with more than 500 students enrolled (Mathema, 2007). With the foundation of Tribhuvan University in 1959, Nepal saw a gradual change in a number of institutions, students' enrollment, program expansion, and coverage. Until 1969, there were altogether 22 colleges at Tribhuvan University, a majority of them located in Kathmandu Valley. Since then, the centrality of higher education institutions has not changed, despite a significant number of new institutions founded and an increasing number of students enrolled. Twelve universities and five medical academies are offering higher education in Nepal. The University Grants Commission Nepal (UGC/N) reported that more than 1,440 campuses are affiliated with these universities (UGC, 2022). However, their distribution is disproportionate across the provinces and ecological regions. This research is implemented at six universities in the country.

Research approach

Convergent parallel mixed-methods design is used, considering the relevance of quantitative and qualitative evidence, to analyze the technological impacts on online learning (Creswell, 2014). Data obtained from surveys and interview sources are simultaneously applied to interpret the disadvantaged students' interest and motivation toward online learning. Using a convergent parallel mixed approach (see Figure 1), the research connects the findings of the quantitative data from the survey with qualitative data collected through personal interviews. Published sources are applied to design interview and survey questions. These include Nepal Census Report, 2021 (GoN 2021); Nepal Telecommunication Authority Report, 2022 (NTA, 2022); UNESCO Policy Paper, 2022 (UNESCO, 2022). Higher Education Strategy Report, Asian Development Bank (2015); and Data Set for Access to Electricity (World Bank, 2023). The study identified disadvantaged students' interest in online learning and linked it with their motivations toward the new modes. Students' interest was quantitatively assessed, whereas their motivation and experiences were qualitatively evaluated. The convergent parallel mixed method allowed the data validations and result triangulations for conclusive findings (Creswell, 2014). Survey data are analyzed using descriptive statistics and a chi-square test to determine the significant association across measurements.

The survey was administered among college and university students attending bachelor's and master's degrees in six universities across Nepal between April and June 2021, when the Nepal government imposed a national stay-home order to control the spread of the second wave of COVID-19. The first case of COVID-19 in Nepal was detected on 23 January 2020. With the geometric rise of the cases, the government announced a country-wide lockdown on 24 March 2020, lasting until 21 July 2020. During that first country-wide lockdown, all public and private agencies were shut down, including the higher education institutions. Later, following the government's decision, Nepal's HEIs announced online learning modes for the first time, starting 28 March 2020.

Population, sampling method, and sample size

Nepalese university students who attended online classes between April and June 2021 were the population of the study. During this period, the Nepal government imposed a national stay-home order to control the spread of COVID-19. Students stayed in-house and were required to attend online classes. There is no official record of the students who took online classes during the lockdown among selected university systems. The population of the study is not known. This study covered the students who spent at least 30 h or more of their learning online, either during the first or second lockdown.

Students for the survey were recruited through a network method (Creswell, 2014). Using a convenience sampling approach, the research team targeted graduate and undergraduate students across six universities. The researchers distributed the online survey link among potential survey participants in courses that were being delivered online at their home universities. To reach out to the students at the other universities where researchers were not directly involved in teaching, the authors employed professionals to distribute the survey among online learners. In many instances, the researchers requested that the peers follow up with potential respondents. These peers distributed the form to more than 700 students; among them, 397 respondents had submitted their responses voluntarily. Among the completed

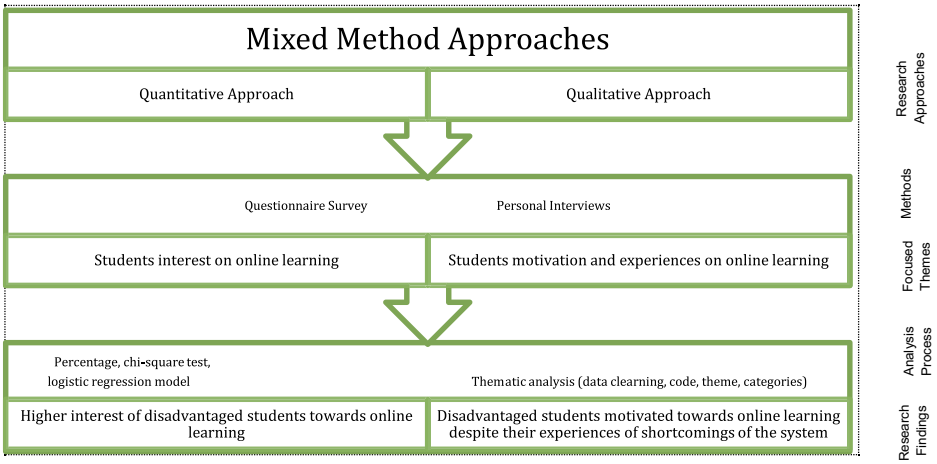

FIGURE 1
Application of convergent mixed methods.

surveys, 324 responses were with 90% completion of the questionnaire. Those 324 responses were included as the final sample of the study. Personal interviews were administered among nine students who participated in the questionnaire survey and agreed to follow-up interviews. They were prioritized based on their rural residential locations and willingness to use online learning methods. During data collection, researchers followed the human subject protection requirements of the universities and the Government of Nepal.

The characteristics of the respondents are presented in Table 1. Tribhuvan University and Pokhara University are two of the six universities in the metropolitan area. The other four universities, e.g., Purwanchal (Eastern), Mid-Western, Far-Western, and Kathmandu universities, are in semi-urban or rural areas.

Instruments design

A semi-structured survey was designed to evaluate the hypotheses and study objectives. The survey was divided into three major sections. The first section included questions on the respondent's demography, including gender, marital status, number of children, employment status, family type, and educational status. The second part consisted of questions on degree majors, online engagement platforms, geographic location of the residence, internet bandwidth, online learning challenges, comfortability of distance learning, and overall perception toward online learning. The third section included some open-ended questions and focused on students' interest in pursuing higher education and the advantages and disadvantages of applying new technology and online learning during the COVID-19 pandemic. The survey pretesting was done among 20 students attending online classes in public colleges in Kathmandu. To check the reliability of the data, 50 respondents who had already filled out the questionnaire and were valid respondents were re-contacted after 15 days through email and requested to retake the same survey. Among them, 34 respondents sent back their responses. The reliability test Cohen Kappa was used, and its score for all variables except open-ended questions is more than 0.8, which is the acceptable value (McHugh, 2012).

The survey was focused on the student's learning experiences and interests during COVID-19 national stay-at-home orders and lockdowns. During 2020 and 2021, students faced a myriad of challenges in learning, especially in Nepal, because online learning was still in its infancy in the country. To better understand their situation, the survey asked, 'Do you feel comfortable studying online from home?' To better gauge their interest in online learning, the survey asked, 'Do you have an interest in taking online classes?' The question on student's experiences of online and in-person learning was, "Based on your experience, did you experience a difference in learning between online and in-person lectures?" The responses were binary for both questions. Similarly, the internet speed varied widely based on providers and geographic areas. The survey question, 'Is your internet speed enough for smoothly running online lectures?' helped to understand their internet connection challenges better. As shown by many previous studies, one of the limitations of students' participation in online learning is accessibility to devices. In the survey, the question related to this was, 'What devices do you use for online learning?' Some of the questions were purposely designed with binary response options (e.g., 'Do you feel comfortable studying online from home?') regardless of their suitability for measuring in Likert scales because the population size was unknown, and the authors were not certain about the sample size (Harpe, 2015). Similarly, it would be challenging to have uniform understanding of the scale values (e.g., 'less comfortable' vs. 'least comfortable') given the diversity of participants in this study.

Online learning and teaching challenges vary by discipline. Courses with lab experiments and field works involve more in-person meetings, which were challenging during the pandemic. To better understand such challenges, a question on whether respondents were majoring in social sciences or other discipline, was asked in the survey.

A few open-ended questions were included in the survey to gauge students' perceptions and experiences of online learning. Two questions were asked, focusing on an explanation of the experience. Questions such as 'What advantages of the online learning system did you find?' and 'What problems did you find in online classes?' were asked to better understand students' perceptions of the new learning mode.

TABLE 1 Demographic information and online learning interests (Chi-Square Test) ($N = 324$).

Descriptions	Online learning interest		χ^2
	Yes	No	
Gender			3.56
Male	86	44	
Female	147	47	
Marital status			2.15
Married	41	10	
Single/not married	192	81	
Students with children			3.22
With children	25	4	
Without children	208	87	
Employment status			1.27
Full-time	71	22	
No employment/part-time	162	69	
Family type			3.89*
Nuclear family	80	42	
Joint family	153	49	
Family size			3.89*
Large (five members or more)	153	49	
Small (less than five members)	80	42	
University type			6.40*
Public	113	30	
Private	120	61	
Education level			12.12*
Graduate degree	161	44	
Others	72	47	
Study majors			10.57*
Social sciences	211	70	
Non-social sciences	22	21	
Online engagement platform			12.37*
Zoom	197	61	
Others	36	30	
Geographic area of residence			2.94
Rural	148	67	
Urban	85	24	
Internet connection during online classes			35.10*
Stable	163	31	
Unstable	70	60	
Family member obstacles during participation			3.08*
Yes	156	70	
No	77	21	
Comfortable at home to participate			74.68*
Yes	187	27	
No	46	64	
Online learning effectiveness perception			26.73*
Same as in-person	108	14	
Not same as in-person	125	77	
Same understanding between online and in-person classes			29.38*
Yes	82	5	
No	151	86	

*$p < 0.05$.

Based on the survey responses, nine students were contacted over the phone to further understand their motivation and experiences of online learning pedagogy, as well as the advantages and limitations of new technologies. The contacted students were among those who participated in the survey. Their selection was purposive. Four were male and five were female. Males represented students without job, with job and taking online classes from villages. Females included housewives and students without job. These participants were among those who showed higher interest and motivation toward the online learning mode in survey responses. The purpose of the interview with the nine students was to understand students' experiences of online classes, their know-how, and the advantages and disadvantages of the new learning mode. Qualitative information thus collected helped researchers to substantiate results from the quantitative analysis and examine the factors associated with their motivation in online learning during the COVID-19 pandemic.

Data analysis

Quantitative and qualitative data are analyzed separately in this research. First, online learning interests among higher education students were evaluated using a binary logistic regression model. The question related to dependent variables was, 'Are you interested in taking on-line classes?' As many previous studies show, students' interest in online learning is often associated with the benefits they could achieve from it. While advantages motivate them, there is a high chance that disadvantages demotivate them and can germinate from technical challenges, including access the new technology, devices, and the internet.

The approach evaluates the relationship between a binary dependent and independent variable. The following model is used to evaluate the relationship (Hosmer and Lemeshow, 2000; Kim et al., 2021; Ghimire S. N. et al., 2021; Ghimire J. et al., 2022; Ghimire et al., 2023):

$$\text{logit}\left\{\Pr\left(Y=1|x\right)\right\}=\log\left\{\frac{\Pr\left(Y=1|x\right)}{1-\Pr\left(Y=1|x\right)}\right\}=\beta_0+x'\beta$$

where Y denotes student's online learning interest with two possible values denoted by 1 and 0, x is the vector of explanatory variables, β_0 is an intercept, and β is the vector of slope parameters of explanatory variables.

The independent variables are binary evaluating internet speed, comfortability to study at home, social science students, differences between physical and virtual classes, use of devices, gender, marital status, students with children, and urban or rural areas.

Close-ended quantitative data were analyzed using descriptive statistics and cross-tabulations. To test the association of interest in online learning with other variables, a chi-square test is conducted using SPSS software, and results are analyzed at a 95% confidence level.

Second, for the analysis of qualitative data, thematic analysis techniques are used. Thematic analysis followed a six-step process, including data finalization, generating code, identifying themes, confirming the themes, naming them, and producing the report (Gibbs, 2007). The steps began with the review of interview transcriptions. The words or phrases linked to research objectives and the factors based on existing literature were labeled as codes. The conservative method was adopted, using colored pencils to label the codes. Similar codes were grouped together as categories. On the basis of the categories, meaning is given to them, which the researcher considered as theme. On the basis of the theme, argument was generated and presented in the Findings and Results and Discussion section. Interview results were compared with survey data analysis to draw findings and conclusions.

Findings and results

The study was carried out to explore students' interests in adopting online learning to continue higher education during the COVID-19 pandemic. This section begins with quantitative data analysis and follows a thematic analysis of interview responses. It presents the participant's demography and explains the relationship between socio-demographic variables and students' interest in online learning using percentages and chi-square values. Based on the results of chi-square tests, the relationship between online learning interests and socioeconomic characteristics, internet access, geographic features, and disciplinary characteristics is assessed by applying logistic regression model. The section concludes by presenting a thematic analysis of the interview data.

A total of 324 respondents participated in the survey (Table 1). A total of 252 (77.78%) students from Tribhuvan University, 29 (8.95%) from Pokhara University, 22 (6.79%) from Purbanchal University, and 21 (6.48%) students from other universities responded to the survey. Majority of respondents (59.87%) were female. Out of 324 respondents, 26.54% were female and 45.37% were male and were interested in online learning. The chi-square of interest in online learning and gender of the respondents are not significant (3.56 with $p > 0.05$). In terms of level of study, 119 (36.73%) students were studying for a bachelor's degree (BA), and 205 (63.27%) were pursuing a master's degree (MA). Of total, 68 (20.98%) students were under 20 years old, 127 (39.20%) were between 20 and 24 years old, and 130 (40.12%) students were 25 years of age and older. In Nepal, students enter the bachelor's level at a minimum of 18 years of age.

Marital status and family structure are important variables to examine the students' interest in adopting online learning. Among the sampled students, 273 (84.26%) were single, and 51 (15.75%) were married. 59.26% of unmarried respondents were interested in online learning. 8.53% of total respondents had at least one child, whereas 7.72% of the total with children were interested in taking online classes. The chi-square result between interest in online learning and children was not significant at a 95% confidence interval. In the study, 122 (37.65%) respondents were living in a nuclear family, and 202 (62.34%) were in a joint family. 24.69% of those living in nuclear families and 47.22% of those living in joint families were interested in online learning. In this study, 71.3% of the respondents were unemployed/part-time employees, and 28.70% were full-time employees. The study also shows that 50% of respondents who were full-time employed were interested in online learning, and 21.91% of those who were unemployed/part-time workers were interested in online learning. For family size, 62.34% of respondents lived in a large family size (more than five members) and 37.65% lived in a small family (less than five members). The significant differences between the demographic characteristics and online learning interests were evaluated using chi-square values.

Most respondents were from government-affiliated private colleges. 44.14% of total respondents were studying in public campuses, and 55.86% were studying at private colleges. Out of public campus participants, 34.88% were interested in online learning, compared to 37.04% for private college participants. The chi-square value between institution types and interest in online learning was significant (6.40, $p < 0.05$). One hundred and sixty-one out of 324 respondents were studying at the graduate level. Among them, 49.69% were interested in online learning. In terms of discipline, the majority were in social science programs. 86.73% of respondents in the total were affiliated with social science programs, and 13.27% were studying non-social science disciplines. 65.12% of social science students were interested in online learning, and it was 6.79% for non-social science students. In terms of online engagement platforms, 258 out of 324 used Zoom, and the rest used other online meeting platforms (Google Meet, Microsoft Team, and others). Among Zoom users, 60.80% were interested in online learning, while 11.11% were other platform users. Among the respondents, 66.36% took online classes from rural geographic areas, whereas 33.64% attended from urban areas. 45.68% of rural attendants were interested in learning online, and 26.23% of total urban participants were interested in attending classes online. The association between online learning interests and other characteristics was evaluated using chi-square statistics. It was significant for university types, family sizes, education levels, online engagement platforms, study majors, stability of internet connection, comfort feeling with home learning, effectiveness perception of online learning, and perception of the online and in-person understanding of course materials.

The relationship between online learning interests and socioeconomic characteristics, internet access, geographic features, and disciplinary characteristics was further evaluated using the logistic regression models. The results are presented in Table 2. Online learning interest is the major determining factor in the success of students during the COVID-19 lockdowns (Noor et al., 2022). In this study, students were asked whether they were interested in online learning. The responses were binary (yes/no). This question was treated as the dependent variable, and social, economic, and technical binary variables were employed as independent factors. The modeled group here was the group of students who expressed their interests in online learning. Multiple iterations of the model were run to make sure that all the significant social, economic, and technology-related factors were included in the model.

The model interestingly showed that during the COVID-19 pandemic, parents with children were interested in participating in online learning. Parents with children are 9.05 times more likely to be interested in taking classes online compared to those without children. The online classes for parent students offered convenience and flexibility to fulfill their extended roles as teachers and parents (Manze et al., 2021) when children stay home due to the lockdown and stay-at-home orders. School children needed assistance from their parents during COVID-19 lockdowns (Haller and Novita, 2021; Rousoulioti et al., 2022). In the case of Nepal, schoolchildren had limited online learning experiences, resulting in parental assistance for them to attend online classes from home. As a result, couples with children had to assist their children's learning. Internet speed has a tremendous role in motivating higher education students to attend online courses. Students with sufficient internet speed are 4.11 times more likely to be interested in taking online courses than others.

Although the response from social science students is dominant in the survey, the logistic model shows that the social science major students were more interested in taking online courses. They were 2.37 times more likely to be interested in online classes than other students. Lower responses from students outside of social science disciplines might have influenced these results, but previous studies have shown that course classifications have significant roles in students' preference and satisfaction with online learning during COVID-19 lockdowns (Huang et al., 2024). In contrast, students who perceive no differences between in-person and virtual classes are 6.12 times more likely to be interested in online learning compared to their counterparts. The multiplicity of learning hardware also influenced interest in online learning. Laptop and phone users in online learning were 1.97 times more likely to be interested in online classes compared to other students.

Household size has a positive role. Students from a household with five or more members are 2.13 times more likely to attend online courses than others. The results also showed that female students were 2.26 times more likely to be interested in taking classes online than male students. Students who liked studying from home were 8.17 times more likely to be interested in taking classes online. Geographic areas (rural vs. urban) did not have a significant influence on students' interests in online learning. In the same manner, other demographic characteristics, such as marital status and employment status, also did not have a significant influence on online learning interest among students.

Thematic analysis of students' online learning experience

In this section of the study, students' online learning experiences collected from personal interviews are thematically analyzed. Two broad themes, namely, the advantages and disadvantages of using online learning, have been explained.

TABLE 2 Logistic regression model results.

Parameter	*df*	Estimate	Standard error	Wald χ^2	Odds ratios	Pr. > χ^2
Intercept	1	−3.405	0.6187	30.2919		<0.0001
Female	1	0.8161	0.3305	6.095	2.262	0.0136
Comfortable to study from home	1	2.1003	0.3372	38.7942	8.168	<0.0001
Enough internet speed	1	1.4151	0.3343	17.9213	4.117	<0.0001
Social science major students	1	0.8645	0.4406	3.8493	2.374	0.0498
Perceive no difference in lecture understanding between physical and virtual classes	1	1.812	0.5768	9.8699	6.122	0.0017
Household size of five or more	1	0.7592	0.3303	5.2842	2.137	0.0215
Laptop and phone use in online learning	1	0.6775	0.333	4.1389	1.969	0.0419
Students with children	1	2.2023	0.9031	5.9463	9.046	0.0147
Married	1	−1.1761	0.6355	3.425	0.308	0.0642
From urban areas		0.6657	0.3482	3.6565	1.946	0.0559

Advantages of online learning

Flexibility and convenience

Analysis of interview responses showed that flexibility of time, spaces, and platforms and ease of use were the most significant advantages of using online learning system. Students mentioned that they could take classes from 'home,' 'while resting at home,' 'learn from home or any other place,' and 'before and after office hours.' A female student with a social science major, who attended online classes from rural areas said that 'students have the freedom to juggle their careers because they aren't tied down to a fixed schedule.'

Most students preferred online learning because they could record the lectures and access the learning resources online asynchronously. 'Recording, listening, and repeating' were the noted advantages of the new online learning mode. Respondents found that they could listen to the recorded lectures 'repeatedly' and 'in convenient time' and read lecture notes whenever they were free. Explaining the convenience, a student responded, 'all information I need will be safely stored in an online database.'

Some of the respondent students noted that they were 'getting lecture notes' in power point form before the classes. For another participant student, online learning was,

> *Very convenient for distant learning, evening time class are very suitable for students engaged in jobs and other livelihood purposes.*

Students pointed out that online learning is 'good for job holders.' The main keywords they used about online learning in their responses were 'most beneficial,' 'convenient,' 'easy,' and 'appropriate.' They mentioned that flexibility was the main reason. An unmarried job holder male student explained,

> *I am engaged in a profession. So always attending the class physically is difficult for me. So the online class is very convenient for me.*

Another job holder participant said,

> *Being a job holder and having interest for study and not having enough time to go for college, it is an advantage to read. I would like to thank Ratna Rajyalaxmi College for this opportunity.*

Beneficial for distant learners

Interviewees found that online learning is a good learning medium for them, as opposed to distant learning. While explaining the benefits of online learning, a participant explained,

> *There are many advantages to attain online classes. Students who want to learn from distance and cannot attain class are benefitted…. They are able to join classes from anywhere.*

This advantage was noted by students attending classes from both rural and urban areas. Respondents explained that online learning mode was good for 'people who cannot physically attend classes', 'who live far from colleges', 'who want to learn from distant places and who cannot attend physical classes', 'can be accessed from any location' and 'students living in the far places can attain the classes and submit assignments in time.'

Useful at the time of the COVID-19 pandemic

Students also saw the advantages of online learning during the COVID-19 pandemic. They reported that the new learning mode was 'safe at the current situation' to continue education. Students were 'safely staying at home and giving continuity to their education.' In this line, a respondent explained,

> *At this time online classes are for prevention from the corona virus,* i.e., *COVID-19, so a major advantage is preventing from the COVID-19 as health always comes first. So, reading with social distancing is the major advantage.*

A female student with a business administration major at bachelor's level in a private college who attended classes from a rural area mentioned,

> *As an advantage of online classes, we students are safely staying at our homes and giving continuity to our studies. The materials and lectures are saved in a drive which makes the accessibility easy and is for a long term. We can learn while being at home even if we are sick.*

Time and cost-saving

Time and cost-saving were another advantage that surfaced in open-ended responses. Students mentioned in their open-ended responses that online learning was 'time-saving,' 'time comfortable,' 'good time management,' and 'does not need extra time for getting ready and reaching college.' While explaining the value of time and cost, one student explained,

> *There are many more advantages of online learning such as flexibility of time, recording, notes, gaining own time and getting reading materials. Students can read from home. They can manage time.*

Disadvantages of online learning

Monotonous and hectic classes

A lack of proper internet connection and unstable electricity were mentioned as the major disadvantages or challenges of the new online learning system. Respondents also felt classes were less focused and deliveries were monotonous. Some students reported that the classes were 'hectic' because 'the colleges organized more than five classes in a day.' An unmarried female student with a natural science major who attended online classes from a mobile device remarked,

> *I think it is quite uneasy for students as there is no good environment in our house to study. There are more than 5 classes [in a day] which is quite hard for the students as staring the laptop or mobile phone continuously can hamper the student a lot … their eyesight can be dull. So do something whatever you all can do.*

Not suitable for lab-based and practice-based courses

Synchronous lecture hours were also 'not suitable for job holders.' The interaction between teachers and students and between students

and students was poor in online classes. As a result, respondents have mentioned that lectures were 'not understandable as physical classes.' Some students with the natural science major mentioned that 'practical courses, e.g., math, statistics, science were not good.' Students remarked,

> *The interaction between students and teachers is not so well and there is lower chance of rapport building between teachers and students. In the context of presentation, it is not better than physical class because the demonstration capabilities of lectures are not shown well in the online class.*

Low institutional preparation

Respondents also commented on poor 'institutional preparation' before and during online classes. They reported that 'lectures were not on time', 'teachers were not prepared and well trained', and 'not having a systematic approach from the institution regarding creating time schedules and follow up on the students.' One participant student said,

> *Pedagogy is outdated. Some professors just come and read the slides and only answer to those questions to which they feel comfortable or know the answers of. There is no room for innovation, since there is participation of around 200 students at a time. So interaction is one of the major concerns.*

Lack of physical devices and space at home were also reported as challenges students were facing while attending online classes.

Discussion

This section provides a triangulation of the results obtained above by analyzing both quantitative and qualitative evidence. This process includes a combination and comparison of research findings from quantitative as well as qualitative data with the findings of previous empirical studies. The results of this research are also compared with the findings of published national as well as international statistics. This process of mixing results from two data sources allowed researchers to tally students' responses in survey form and during the personal interview. It was helpful to examine students' perception about the whole online learning system, including factors associated with their interest toward online learning as well as the advantages and disadvantages of digital technologies.

HEI's responses to the COVID-19 pandemic by shifting traditional face-to-face learning mode to the new online learning system had disproportionately impacted students across countries. In many senses, this study agrees with the previous findings that student's participation in higher education encountered challenges during the COVID-19 pandemic. Despite this, this study revealed that the majority of the students were interested in the new mode of learning and so retained their education during the COVID-19 outbreaks. More specifically, disadvantaged students showed higher interest in accessing online classes during the period.

This finding contrasts with many previous findings which argued that the COVID-19 pandemic further amplified their situation, making them more vulnerable (e.g., Miranda Pinto, 2020; Mphahlele et al., 2021; Harefa and Sihombing, 2022; Nayak and Alam, 2022; Roy and Brown, 2022). In the case of Nepal, Devkota (2021) found that learning was unreachable to disadvantaged students, and so they were disconnected and disengaged from online tutoring. Ghimire et al. (2021) highlighted that institutional unpreparedness, lack of student support, and lack of access to electricity and internet challenged disadvantaged students to retain their education during the COVID-19 pandemic. In this study, thematic analysis revealed that these factors were the problems associated with online learning systems, but participant students showed significant interest in online learning despite internet and electricity instabilities. This is an important direction for HEIs as well as policymakers to ensure students' access to higher education and meet the global goal of 'education for all.'

In Nepal, despite the higher enrollment rate (UGC, 2022), female students' dropout rate is higher, and the degree completion rate is low among females (Parajuli et al., 2007). Due to sociocultural beliefs, girls have historically been disengaged in education across all developing countries. This study found that female students were more interested in online learning than male students. It implies that the new online learning mode of education could motivate them to retain and continue their education among female students. This reduces the female students' dropout rate and increases the rate of degree completion. The outcome may impact women's job prospects, thereby ensuring overall gender equality.

Students with children were another group that was significantly motivated toward the online learning mode. Due to family commitments and responsibilities to their children, they face hardship in accessing higher education. Face-to-face teaching required them to visit campus in a routine, and it was not feasible for them. However, the new online learning mode could provide them with access to higher education. This sets directions for HEIs and government agencies to increase enrollment in their programs by attracting off-campus students.

Today, students' enrollments across social science-related majors are significantly low in comparison to the disciplines related to science and technology, engineering, and management [STEM] (Goldstein, 2021). Students with social sciences majors belong to lower economic quartile and rural areas (Khanal, 2019). Previous studies (e.g., Parajuli et al., 2007; Bhatta et al., 2008) found that a significantly higher percentage of girls, Janajatis, and Dalit students (socially marginalized students) are enrolled in non-technical courses, including social sciences majors, in Nepalese universities. This study found that students with social sciences majors were among the students who were significantly interested in online learning. This means that the new online learning mode could be helpful to ignite the interest of girls, ethnic minorities, and economically poor students to pursue higher education with a social sciences major. The application of online learning may retain students in this branch of education. This claim parallels the findings of a study where a vast majority of students with Social Sciences and Humanities major positively evaluated the use of digital technology in remote study. The study concluded that use of digital technologies in remote study could improve the Social Sciences and Humanities education (Onikienko et al., 2022). Students who belonged to a larger family size (more than five members; the national average is 4.32; Government of Nepal, 2021) were also motivated toward online learning.

Previous studies found that students perceive no differences between online and in-person classes. This finding is based on the examination of the perspectives and effectiveness of online education during the pandemic (Almahasees et al., 2021; El Said, 2021). This study revealed that those students who found no differences between the two modes of learning were interested in online learning systems. This implies that the new online learning system could motivate a larger body of students who prefer online as well as traditional face-to-face classes.

This study found that the advantages of the modes were the major causes behind students' preference for the online learning mode in higher education. Students believed the online learning system had a recording option and flexibility with time, space, and platforms so that they could retain their education anytime, regardless of location. Students could participate in class time and access reading materials and lecture notes at their convenience in the new online learning system. These advantages of online learning were mostly beneficial to those who willingly or unwillingly disengaged themselves from in-person deliveries at campuses.

This study examined how students' interest in online learning is associated with various geographical, social, cultural, economic, and technological factors, with a particular focus on disadvantaged students. A combination of quantitative tests and qualitative analyses revealed a detailed picture of how and why students adopted online learning during COVID-19 in Nepal. Students' higher interest drawn from the test results was substantiated by the subjective factors that motivated them toward online learning.

In this study, test results show that rural students have greater interest in online learning. Thematic analysis showed that rural students' higher interest in online learning was associated with its features such as 'flexibility,' 'convenient,' and 'learning from home or any other places.' Similarly, female students showed a greater interest in online learning, which was associated with the usefulness of the system and ease of use. Thematic analysis revealed that the causes of their motivation were that they could 'study from home' and 'retain them in the education.' It was 'comfortable,' and 'time management' was possible. In a study, Gustiani et al. (2022) found that students' motivation toward online learning was influenced by their interest, enjoyment, and satisfaction with the new technology. This confirms explanations of the Technology Acceptance Model (TAM), which argues that 'perceived usefulness' and 'ease of use' are the major features of a new communication technology that attracts users (Davis, 1989). In this study, disadvantaged students perceived that online learning was useful and comfortable to meet their interests in higher education. For example, the higher interest of social science major students was influenced by their perception that online learning was 'flexible' and that 'students can use it even in the workplace' and that it is 'good for job holders.' According to Yan et al. (2022), students who perceived online education as useful performed better and were satisfied.

The case of Nepal revealed that the major advantage of online classes is their suitability for working students and students living away from campuses. Both groups belong to the underserved categories that remain outside of educational institutions (Hannay and Newvine, 2006). Bisciglia and Monk-Turner (2002) mentioned that students who work full-time and attend classes off-campus are more likely to be motivated and interested in taking online classes if options are available. Though the regression model did not find any significance between students with jobs and their interest in online learning, the thematic analysis showed higher motivation among these students toward the new system. The growing expansion of internet systems across the provinces and regions may benefit from students' choice and interest in online learning systems.

Another major reason for students' interest in the new learning mode was that they could access the classes safely during the COVID-19 pandemic. This implies that the online learning mode was helpful in complex situations such as COVID-19 as well as for those students who faced challenges to retain higher education due to severe medical conditions.

As shown by other cases, respondents in this study reported some disadvantages of online learning. The lack of stable electricity and internet connections was the major impediment to online learning. The participant students of this study also pointed out the lack of institutional plans, trained instructors, learning spaces at home, and multimedia devices. They showed concern over the delivery of lab-based and field-based technical courses. Despite these challenges and hindrances, students' interest in online learning was not compromised during the COVID-19 pandemic. In Nepal, more than 90% of the population has access to electricity (World Bank, 2023). According to Nepal Telecommunication Corporation (2021), almost 91% (27.76 billion) of the population has access to the internet and phone service. The NTC report mentioned that most people have access to the internet on their mobile devices. Another study (Rijal, 2019) revealed that half of the population uses smartphones to access the internet and that there was an 'exponential growth of users from rural areas.' In this study, a majority of the respondent students attended online classes from rural areas, and a high majority of the respondents used mobile phones and Zoom platforms to access online classes.

Limitations and future directions

While existing research highlights several shortcomings of online learning systems and tends to argue that the new learning system augmented pre-existing discrimination among disadvantaged and underserved students, this study proposes a novel finding. It found that students adopted the new mode of learning and retained, most specifically, disadvantaged students in the education and motivated them for learning. At the same time, this study has certain limitations that must be ascertained. Firstly, this study has not specifically defined students' interests and motivations toward online learning. It was left to the respondent students to self-define it in the survey. The rationale behind this was that the variables measured in this study were adopted from numerous publications. Some of the measurements in this study are binary, which could have been tested in continuous or Likert scales. For example, the students' comfort levels of using online learning can be measured in Likert scale while using larger sample sizes from known population. Secondly, this study is based on purposive and convenient samples of universities in Nepal. Among 12 universities, only six universities were selected. It might be the case that each university has different capacities to deliver online courses. The electricity, internet, and gadgets services availability may vary in each university. This study did not consider these factors.

Thirdly, this study examined a limited number of sampled students who took online classes during the nationwide lockdown

caused by the COVID-19 pandemic in Nepal. Higher education institutions did not record how many students were retained in the system. So, samples were taken conveniently from the indefinite students' population who took online classes for at least 30 h in the I and II phases of the lockdown. Those samples included students in general. With random sample sizes covering all 12 universities, additional social, economic, and technological variables, such as caste, ethnicity, income, internet service types, learning tools, etc., can have a significant relationship with the learning choices and interests among students. In addition to this, the survey did not have balanced representations from natural and social sciences. Most respondents were social science majors. The balanced representations from social and natural sciences could have offered additional insights into the student's interest in attending online courses. So, a larger number of systematically selected samples could probably offer a more comprehensive understanding on how disadvantaged groups of students perceive online learning system and motivate to learning.

Finally, this study has not considered how intervening social and economic variables have affected disadvantaged students' motivation toward a new learning system. This seems significant because several studies highlight that economic and social barriers affect students' motivation and retention in education.

In the following paragraph, directions for future research are provided. First, a focused study on disadvantaged and underserved groups of students will offer a better understanding of the specific impacts of distance learning. Any future research could explore how 'ethnic minorities' and 'lower caste' students perceived online learning during the COVID-19 and how their interest and motivation toward the new learning platform. It could further explore what factors motivated them to adopt the new system and what they expected as learning outcomes. This could be substantiated by examining what are their expectations with the HEIs. Secondly, studies should extend the scope of the study by covering all universities of the country. Systemic random sampling should be organized. Thirdly, this study was conducted in an abnormal situation created by the COVID-19 lockdown. The replication of the study during normal times would show how technological innovations are empowering disadvantaged students. Finally, forthcoming researchers may want to compare the success rate of disadvantaged students with that of 'other students'.

Conclusion

The purpose of this study was to explore students' perceptions and experiences with online learning mode during the COVID-19 pandemic in Nepal. More specifically, this study explored the role of online learning systems in boosting the participation of disadvantaged students. This study concludes that through the new online delivery implemented during the COVID-19 pandemic, students in higher education retained their studies.

Online learning significantly motivated disadvantaged students' interest in higher education. Females, couples with children, students with a social science major, and students who wanted to study from home had options to access higher education through online learning mode during the precarious times of the pandemic. This conclusion contrasts with the previous studies, which concluded that the new online learning system amplified pre-existing discrimination against disadvantaged students in higher education.

This study concludes that the online learning system could be a lifeline for disadvantaged students in the post-pandemic era if they are given this option. The system will sustain higher education attainments among disadvantaged students because it provides flexibility and engagement options for them. Such advantages motivate disadvantaged students' interests with wider opportunities. Nevertheless, concerned stakeholders must address the problems associated with its usage, such as stable electricity supply, high-speed internet, and institutional planning and capacity building among instructors with additional tools and techniques of interactions and engagements.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The studies involving humans were approved by Research Committee, Center for Nepal and Asian Studies (CNAS), Tribhuvan University (TU). The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

RN: Conceptualization, Data curation, Formal analysis, Methodology, Supervision, Writing – original draft, Writing – review & editing. BK: Conceptualization, Data curation, Methodology, Project administration, Resources, Writing – review & editing. SG: Conceptualization, Data curation, Methodology, Software, Validation, Writing – review & editing. JG: Methodology, Software, Validation, Writing – review & editing.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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