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Digital Learning, Mediating Effect of Instructor Facility on Student Satisfaction at Universities

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Abstract: Digital learning is essential to explore digital platforms at university. The study considered a quantitative approach to examine the impact of digital learning on student satisfaction at various universities in Nepal. The paper also focused on analyzing the mediating effect of instructor facility on student satisfaction. Several pieces of information were attained from the 225 students of Tribhuvan University, Kathmandu University, Purbanchal University, Pokhara University, and Rajarshi Janak University through stratified random sampling techniques. Data was converted into valuable information by analyzing raw data through SPSS software and used for frequency analysis and exploratory factor analysis. Next-level analysis was performed by AMOS software for structural equation modeling to examine student satisfaction with digital learning and the mediating effect of instructor facility. The result of the paper found all dimensions significantly influenced on mediating construct of instructor facility and student satisfaction. It also identified convenience as the most influential factor than technology in instructor facilities. However, the result demonstrates that technology was the most influential factor, rather than convenience, on the dependent construct student satisfaction. It revealed that instructor facility significantly affects student satisfaction. So, digital learning becomes effective, and efficient, when convenient digital portals, technology facilities, instructors' knowledge, educational institution systems, and students are thoroughly engaged with it.

Keywords: Convenience, Digital learning, Instructor facility, Student satisfaction, Technology

INTRODUCTION

The educational environment has changed in the information age due to information technology in the form of digital learning. The term digital learning refers to the emerging paradigm of using information and communication technologies (ICT) to provide educational and training materials to learners in a methodical manner (Chitkushev et al., 2014; Nikou & Maslov, 2023). The e-learning platforms are based on the online dissemination of knowledge, ideas, and facts through digital communication (Jean-Louis, 2023; Shehzadi et al., 2020). Digital learning is essential in the current era of information technology advancement and innovation. It is especially crucial in the COVID-19 era when digital platforms support continuing distance education (Babalola et al., 2023; Gautam & Gautam, 2021; Sah, 2021). The global COVID-19 epidemic has had an impact on higher education institutions. The implementation of a national lockdown in several nations resulted in a significant reduction in student face-to-face physical engagement at institutes of higher learning.

The COVID-19 pandemic influenced all activities, that broke out in March 2020, and directly and indirectly impacted people's lives worldwide (Cicha et al., 2021). Every corner of human existence was affected, including education, globally (Acharya et al., 2024; Paudel, 2020; Sah, 2021). The United Nations Educational, Scientific and Cultural Organization (UNESCO)

explained that the pre-primary to higher education institutions were closed, affecting children and youth worldwide. Most pupils in different nations cannot attend school due to the pandemic (Sah, 2021; UNESCO, 2020). Nepal's government has decided to shift many physical everyday activities to digital activities to prevent the spreading of the virus (Acharya et al., 2024; Gautam & Gautam, 2021; Sah, 2021).

Many technologically advanced nations have implemented distance learning as a way to make up for the loss, including the US, UK, France, Italy, Germany, China, France, Japan, Australia, and so on. Their e-learning platforms were promptly improved to provide shared portals for remote learning centers and give students mobile device access to e-content and repositories (Aristovnik et al., 2020). In these nations, all parties involved including institutions, parents, teachers, and publishers have teamed up to provide digital resources, including learning materials and textbooks, that can be used in virtual classrooms (Filip et al., 2022).

Digital learning has become a disruptive force that is upending traditional teaching and learning paradigms in today's quickly changing educational landscape. The broad field of digital learning includes interactive simulations, online courses, virtual classrooms, and adaptive learning systems. It is defined as the process of using digital technologies to offer educational resources and support interactive learning experiences (Yadav, 2024).

So digital learning removes geographical barriers by enabling both professionals and non-professionals to access educational materials from any location with an internet connection. They can better and more effectively manage their time between job, family, and education if they customize their experience to fit their schedules. The instructors used direct instruction, conversation facilitation, and good instructional design to establish a well-learned atmosphere and close the gap between online and in-person learning (Monika & Kristanto, 2024). It is also essential to use virtual learning to support and maintain global educational advancement (Babalola et al., 2023).

E-commerce has started to operate globally, including digital banking, shopping, education, and other services. Many people using networking sites globally emphasize its significance in various facets of society, making it a valuable communication tool and a platform for starting several new businesses (Gautam & Sah, 2023). Additionally, the potential of the internet facility for every sector and the incorporation of organizations into the pandemic and post-pandemic environment have developed into a consistent practice that strives to differentiate themselves in the world (Hettiarachchi et al., 2021; Khan et al., 2021; Soares et al., 2023; Xu & Xue, 2023). Since, online education has become the predominant format for instruction. Undoubtedly, this presented an opportunity for the growth of digital learning during the pandemic and post-pandemic (Li et al., 2021; Nayak et al., 2022; Sah, 2021; Sharma et al., 2021).

Higher education is now offered in Nepal through 11 central universities, 2 regional universities, and 5 medical academies. Nepal's oldest and largest institution, Tribhuvan University, caters to students from all socio-economic strata. All Nepalese universities offered online courses during COVID-19, However as of 2016 only Nepal Open University provides distance learning (UGC, 2016). The institution is under pressure from the COVID-19 epidemic to integrate digital learning across its faculties and departments. Nepalese universities have announced that a digital education system in place of a physical education system must be implemented in all central, constituent, and affiliated colleges to prevent academic loss (Paudel, 2020; Sah, 2021). It has also trained teachers and students in using Micro-Soft Team as the official software for teaching, learning, emailing, and performing any work related to the institutions. It has also created guidelines for online classes (Paudel, 2020). The advantage of digital learning is that it broadens the educational benefits and increases learning chances while enhancing students' aptitude for and competence in self-directed learning. However, young students lack self-control, which may cause severe issues in digital learning (Hamal, 2021; Sah, 2021; Sharma et al., 2020; Upadhyay & Sedain, 2019).

Educational institutions favored discontinuing traditional instructional activities and moving educational activities to the digital environment to avoid the virus's spread and physical

presence (Acharya et al., 2024; Butnaru et al., 2021; Gautam & Gautam, 2021). Mobile devices that can be used to access information anywhere and anytime, such as smartphones, tablets, and laptops, were required to adopt digital learning. In education, mobile technology plays a significant role in achieving distance learning objectives (Nadeak, 2020; Upadhyay & Sedain, 2019). Faculty and students must quickly switch from traditional face-to-face instruction to distance learning formats using virtual classrooms (Neuwirth et al., 2021).Thus, students have the choice to continue their education online while maintaining the safety and well-being of both teachers and students (Alasagheirin et al., 2023).

However, the disruption of schooling and the anticipated slowdown in global growth brought on by the economic downturn profoundly affect the most disadvantaged kids, who have come from socio-economically precarious families (Acharya et al., 2024). School closures have prevented pupils from learning new things, but it has also caused them to forget what they already knew (Coman et al., 2020; Khan et al., 2021; Upadhyay & Sedain, 2019; Wright et al., 2023). The difficulties of online teaching and learning include being aware of the digital environment, using the medium effectively, giving students timely feedback, having little or no face-to-face interaction, having more work, and having a strict need for self-discipline (Basnet et al., 2021). According to several academic research findings, the poor attendance of students academics in digital classes at Tribhuwan University led to a critical examination of the issues (Nepal, 2020; Sah, 2021). Other universities, including Kathmandu University, Purbanchal University, Pokhara University, Rajarshi Janak University, and nearly all major universities, have formulated a plan and implemented digital teaching and learning to maintain and manage educational activities and prevent any potential academic loss brought on by the closure of a COVID-19 preventative step.

The use of online teaching and learning to address students' learning loss was hindered by a contradictory policy, a lack of resources, the attitudes of teachers, socio-psychological problems, a shortage of technically efficient instructors, and a lack of alignment between curriculum, pedagogy, technology, and assessment (Thapaliya et al., 2023; Gharti, 2023). Higher education in Nepal has benefited from the emergence of digital learning in several ways after the COVID-19 pandemic. It has facilitated easier access to education for students in Nepal and throughout the globe. The use of digital technologies has made education more engaging and dynamic due to digital resources like movies, animations, and simulations (Rawal, 2023; Gharti, 2023). This digital technology has made it easier for teachers to monitor their pupils' progress and provide them with ongoing feedback (Thapaliya et al., 2023).

University education is also being revolutionized by the use of digital technology in teaching, learning, and research to acquire skills, information, and resources for managing through generative artificial intelligence, or ChatGPT (Sah, 2024). In this context, the current study intends to examine the effects of the digital learning education system on student satisfaction at different universities to enhance the success and efficacy of digital teaching and learning as a paradigm shift in higher education in Nepal. However, a large number of empirical research have focused on the satisfaction with digital learning from the viewpoints of students, instructors, staff, and parents before and after the COVID-19 outbreak (Poudel & Subedi, 2020; Xu & Xue, 2023). So, the research issues were also addressed mediating the impact of instructors' facilities on student satisfaction levels. Which factor mainly affects student satisfaction in university education during COVID-19 in Nepal? Are students' satisfaction affected by the digital education system? Does instructor facility mediate affect student satisfaction? Based on research questions, the research objectives are to examine the most influential factor of student satisfaction in university education Nepal and explore the instructor facility's mediating influence on student satisfaction.

Literature Review

Modern technical developments enable the use of various methods. It is crucial to consider students' satisfaction levels while creating digital courses to make learning successful and fruitful. Student satisfaction relates to the learner's preparation, the instructor's teaching method, and

digital collaboration and collaborative learning technology. Thus, the study model and hypotheses were developed based on the relevant literature.

Convenience and student satisfaction

The term convenience refers to how much a user thinks a specific technology would help them perform better at work or school than other options (Cicha et al., 2021). Researchers discovered that students intended to use learning technologies for convenience at Poland University. The convenience of digital learning is one of the essential constructs for student satisfaction. So, it is a dimension that measures how much a person thinks utilizing a particular system would be effortless (Soares et al., 2023). User perceptions about convenience and usefulness are recognized as key elements in terms of technology acceptance and student satisfaction, as stated by Samed Al-Adwan et al. (2020).

In India, Muthuprasad et al. (2021) explored the student's perceptions and preferences for various attributes of digital education to design an effective and efficient digital learning environment. They obtained data from agriculture students 307 through an online survey. The results explained that most respondents were ready for digital classes to manage the curriculum during a pandemic. Most students consider digital learning convenience using their smartphones. Khan et al. (2021) also recognized the advantages of digital education during the COVID-19 pandemic in India. E-learning has developed to speed up the learning process, and social media may improve learning outcomes even more. Students thought that the flexibility and ease of online classes made them desirable.

According to the students, while internet connectivity challenges in rural locations make it difficult to take advantage of digital learning programs, the flexibility and convenience of online classes make them an appealing option. In China, Li et al. (2021) researched the satisfaction of students, teachers, and parents with digital learning to understand the convenience during the COVID-19 epidemic. Convenience is the extent to which a system user considers that usage effortless. Users will quickly adopt new technology when their favorable opinions of its usability and convenience (Rizun & Strzelecki, 2020). In Nepal's educational institutions at all levels, the nationwide lockdown during the COVID-19 pandemic has caused a significant disturbance.

Students can effortlessly express their ideas and thoughts to others. They can communicate their views and opinions to others with ease. Everyone can instantly share any picture, image, PDF file, essential document, link, etc., through social networking sites to anyone globally. Social networking websites (SNS) provide virtual interaction between pupils (Alasagheirin et al., 2023; Bhakta, 2017; Wright et al., 2023; Xu & Xue, 2023). The comfort level teachers and students experience while learning depends on their ability to use networking sites.

Laptops, smartphones, and tablets with Internet access are among the required tools to participate in and support digital classroom activities. Many students require assistance joining the digital classroom due to the lack of access to well-facilitated digital classroom services, such as computers, smartphones, and tablets with internet connectivity resources. The survey found that some of the biggest obstacles to online learning include high cost, reliable Internet access, and technical resources (Babalola et al., 2023; Momen et al., 2023). Convenience and students' expectations of high-quality education are highly correlated in higher education. Modems, Wi-Fi, and cell phones were among the devices that were frequently used for internet access (Rahayu et al., 2022). Thus, the first hypothesis of this study is related to convenience.

Technology and student satisfaction

Advanced technologies like machine learning and Artificial Intelligence (AI) have been included in digital learning in recent years. Learner data can be evaluated by AI-driven technology, which can also provide personalized guidance and enable adaptive learning experiences tailored to each person's requirements (Yadav, 2024). Many researchers researched on technological aspect of digital learning in different countries. In Poland, in the context of distant learning, the study examined the effects of experience, subjective norms, enjoyment, computer anxiety, and self-efficacy on expectations (Cicha et al., 2021). They discovered that technological support is one of

the critical components of digital learning. Li et al. (2021) found specific possible issues with participant groups with various features, such as online interaction, technological assistance, and learning resources.

The most pressing issues were technological aspects due to a lack of technical skills and ineffective teaching methods for the digital environment (Coman et al., 2020). Samed Al-Adwan & Khdour (2020) reported technological proficiency improved students' willingness to use massively open online courses. Additionally, learner satisfaction with MOOCs is positively impacted by system quality stated by Albelbisi et al. (2021).

The government's educational institutions are empowered to create special regulations in response to diverse conditions in China. Tanius (2020) also researched self-efficacy in digital learning among university students. The research explores the relationship between students' motivation, technical anxiety, and social support with self-efficiency in digital learning. This study received information from 166 college students using digital education for the first time. The findings showed that the digital learning technique's self-efficacy correlates with technology experience, learner attitudes, motivation, computer anxiety, and social support. Hettiarachchi et al. (2021) researched digital learning experiences at Sri Lankan Universities to measure students' satisfaction. The information for the research was obtained from undergraduate students enrolled in humanities and social sciences at three state-owned universities in the country. Analysis of data was carried out by Structural Equation Modeling (SEM). The outcome revealed that perceived learner motivation, challenges, and interaction significantly affected students' satisfaction. It also revealed that inspiration highly influenced students' satisfaction.

Muthuprasad et al. (2021) explored the students' perceptions and preferences for various attributes of online education to design an effective and efficient digital learning environment. They obtained data from agriculture students 307 through an online survey. The results explained that most respondents were ready for online classes to manage the curriculum during this pandemic. However, most pupils believe offline education is the best learning method because students in rural areas of India do not receive adequate instruction in using technology (TarnnumRahimoddin et al., 2021). So, technology-based trust also addresses the relevance of technology in creating trust. Cheng (2011) examined students' perceptions of overall trust, including interpersonal and technological trust, during digital learning.

In Nepal, a few institutions, like Kathmandu University and Tribhuvan University, have started to provide teacher preparation programs. The University's administration must also guarantee that every student can access technology (Dawadi et al., 2020). Technical issues with technological devices may also impact students' satisfaction with digital learning (Mollah & Parvin, 2020; Poudel & Subedi, 2020; Sah, 2021; Yan et al., 2021). Distance learning is made possible with the help of the Internet. Therefore, all stakeholders must work together and actively participate in reducing any potential adverse effects of switching from traditional to digital learning (Tulza, 2020; Sah, 2021). Additionally, Yadav (2024) provided immersive and interactive learning experiences in Nepal, allowing students to explore virtual worlds and model real-world situations. So, the second hypothesis of the current research work considered the technology aspect.

Instructor facility and student satisfaction

Learning quality appears to be significantly influenced by the instructor's priority of teaching and social presence. The instructor's social presence considerably influenced the instructor's judgments of student achievement (Oyarzun et al., 2018). This affects recruitment, retention, instruction, and growth for online teachers. Interaction with instructors is crucial in digital learning since it can eliminate psychological distance and improve knowledge (Nadeak, 2020). Through online education, professionals can access a vast library of information and reliable resources from many fields of study.

Digital learning is considered a valuable tool for reducing the rising cost of postsecondary education by distributing the expense of classes over a much less traditional location for teaching

and learning (Poudel & Subedi, 2020). All digital instructors must work harder to combine pedagogy with technology to benefit student learning (Khan et al., 2021). So, instructor communication during digital learning is valuable for the students (Wright et al., 2023; Xu & Xue, 2023).

The digital gap and the effect of educational practices from various nations on students' digital learning experiences were also issues that raised worry (Barbour, 2006). Sharma et al. (2020) reported that most students in Nepal were satisfied with the course content and the prompt response from the relevant professors and departments over the Internet. The effectiveness and efficiency of e-learning-based components were vital in determining whether students would accept and succeed in the learning process.

A province-wide survey was carried out in China by Yan et al. (2021) to find out how students experienced digital learning during the COVID-19 epidemic. They found that digital learning environments vary significantly between academic years. However, Alsoud & Harasis (2021) explained due to inadequate computer skills and the impression that it would be a huge burden, there were additional drawbacks that the digital educational environment could not be recognized. They found that students from remote and underprivileged areas faced various issues, including limited access to technology, inadequate internet connectivity, and challenging learning environments. Lin et al. (2024) stated that Chinese students aspire for instructors who are engaged in digital learning, intellectually fascinating, and actively encourage critical thinking.

According to Mollah & Parvin (2020), digital courses have been ineffective for a long time since higher education is based on practical, lab, and field survey data and is highly technical, professional, and specialized. The lack of a competent internet network and access to digital learning are just two of the many limitations of online education (Azhari & Kurniawati, 2021). Thomas (2020) found that students who were not freshmen or majored in information technology were much less likely to be active e-learning users based on the logistic model in Thailand. According to Imsa-ard (2020), most students favored face-to-face instruction over digital learning and were resistant to doing so in the future. Monika & Kristanto, (2024) reported Instructors must make every attempt to engage every student in both the online and in-person classroom. Thus, lecturers can act as coaches, moderators, or even facilitators of student interaction. Lecturers must create learning activities to involve their active presence by maintaining social engagement, techniques like changing camera angles, highlighting student speakers, and setting up a breakout space for discussion have been used during sessions.

In Nepal, the viewpoints of 280 instructors and students from Tribhuvan University, Kathmandu University, Mid-Western University, Far-Western University, and Pokhara University were the subject of a study to know the benefits and challenges of digital learning (Paudel, 2020). The participants believed that the main advantages of online education were its promotion of online research, its ability to connect practitioners with the worldwide community, and its ability to provide access to a vast and reliable information base. However, they noted that serious problems included time management abilities, greater independence for educators and students, and dependable internet at work. Sah (2021) researched students' perception of digital learning during Nepal's Coronavirus disease (COVID-19). The research was done by obtaining responses from 225 students from several universities. The outcome showed that physical education was more effective than digital learning at lower levels. However, the study also explained higher higher-level scholars enjoyed digital learning. Chaudhary et al. (2022) also reported e-learning system is still not widely accepted by students as the best and legitimate replacement for the traditional classroom setting. Thus, the third and final hypothesis of the present study is related to the instructor responsiveness factor during the digital learning process.

Most digital learning is evaluated based on three key criteria convenience, technology, and instructor capability. Digital learning has replaced traditional classroom instruction, yet this educational tool's evaluation system has received very little attention. Therefore, this paper seeks to determine the impact of students' satisfaction levels during COVID-19. This study will help

university education develop its plan, policy, and strategies per student needs and increase student satisfaction.

A digital learning system is possible through the development of information technology which is a big challenge for universities. It becomes effective, efficient, and victorious when tutors, students, technology, management teams, and educational institution systems are entirely concerned about online learning. Digital learning techniques could be run more successfully if the significant issues addressed have been examined in this research. Convenience, and technology, are independent variables, instructor proficiency plays a mediating role between digital components, and student satisfaction in the conceptual framework.

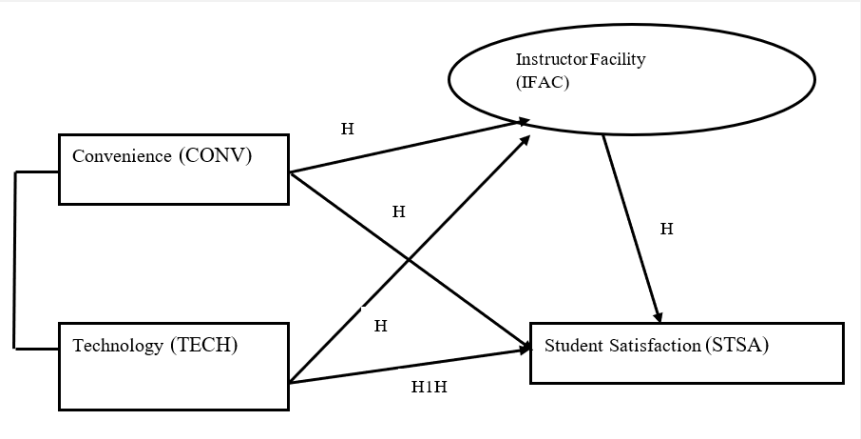

Figure 1. Conceptual framework of Digital learning on Instructor IFAC and STSA

Figure 1 demonstrates the constructs of digital learning are convenience and technology as independent constructs, instructor facility considered as a mediating construct, and student satisfaction considered as a dependent construct. The link between independent, mediating, and dependent components was examined using the structural equation modeling to determine which factor was the most significant. Hypotheses H_1, H_2, H_3, H_4, and H_5 were used to investigate the influential factor of student satisfaction toward a university education.

Research hypotheses

H_1: Digital learning construct convenience has a positive association with instructor facility.
H_2: Digital learning construct convenience has a positive association with student satisfaction.
H_3: Digital learning construct technology has a positive association with instructor facility.
H_4: Digital learning construct technology has a positive association with student satisfaction.
H_5: Instructor facility has a positive association with student satisfaction.

METHOD

The deductive research approach explores the relationship between the digital education systems on student satisfaction. This research approach usually focuses on quantitative information for eventual interpretation and conclusion (Saunders et al., 2003). A structured questionnaire was circulated using stratified random sampling methods to several university students to collect primary data. The universities are divided into groups using stratified random sampling, and random samples are chosen from each group to generate a sample that accurately represents each institution that is regarded as a sampling region. While avoiding the overrepresentation of larger groups, the method ensures that smaller groups are fairly represented and produces more accurate estimates of demographic features. Consequently, the process is unbiased.

All students enrolled in university education during 2019–2020 were included in the study's target population, which was published in 2021. There are 356,654 students enrolled at

Tribhuvan University, 18,643 at Kathmandu University, 27,527 at Purbanchal University, 32,584 at Pokhara University, and 186 at Rajarshi Janak University (UGC, 2021). Standardized questionnaire that had 28 items and was split into two sections, the first section of the survey had 10 generic questions for the responder, and 18 questions made up the second portion, which focused on online education offerings. A Likert scale of 7 points was used to assess all survey questions for the study variables, with 1 denoting strongly disagree and 7 indicating strongly agree. A pilot test of a questionnaire was carried out in a small group of several universities with only 20 students in order to identify issues and ensure that the data collected was correct, pertinent, and validated.

Data were confirmed by 365 students, of which 72 were incomplete, and 68 were disregarded as outliers. Filtering out incomplete replies can better reflect survey completion because they may be less positive than finished responses. A dataset's outliers are a crucial component that offers valuable insights into finding discrepancies and identifying any mistakes in the statistical procedures (André, 2022).

However, only 225 questionnaires (61.64% response rate) were valid for further analysis. According to Sekaran & Bougie (2016), a sample size of at least 30 but less than 500 is adequate for the study. The sample size for the research was considered an ideal sample size (Bhattacherjee, 2012; Cooper & Schindler, 2014; Sekaran & Bougie, 2016). A 100 percent response rate is rarely attained, though, unless the target group is forced to complete the questionnaire (Rogelberg & Stanton, 2007). In studies where participation is voluntary, the researcher shouldn't expect a complete response (DeMaio, 1980), yet researchers that use questionnaires want to have the highest response rate feasible. Greater response rates result in lower confidence intervals around sample statistics, larger data samples, and statistical power (Baruch & Holtom, 2008).

Data were put into the Statistical Package for the Social Sciences (SPSS 20) for frequency analysis of demographic status and exploratory factor analysis for hypothesized rationality. Additionally, Analysis of Moment Structures (AMOS 20) was used for structural equation modeling for measurement and structural model. The demographic composition was analyzed by frequency analysis. The exploratory factor was done to achieve the theoretically expected factor solutions. Kaiser–Meyer–Olkin (KMO) and Bartlett's tests had been used to check the adequacy of the collected sample. Next, structural equation modeling is utilized for the measurement model to access convergent validity and discriminant validity of the construct items. The model also identified the most influential factor and mediating effect of student satisfaction. Results were crafted in the table, figure, measurement, and structural model.

RESULTS

Demographic status confirmed that 53.3% are males and the remaining females. According to the age group, most respondents were 18-25 with 57.3%, 26-35 with 31.6%, 36-45 with 6.7%, and above 45 with 4.4%. Regarding marital status, 77.3% of students did not have a spouse, 12% had a spouse but no children and 10.7% had a spouse but children. Most students 60.9%, were from Tribhuvan University, 14.7% from Purbanchal University, 10.7% from Kathmandu University, 7.1% from Rajarshi Janak University, and 6.7% from Pokhara University.

Regarding employment status, 60.9% of people are without a job, 23.6% work in the private sector, 8% in other employment types, and 23.6% in the government. According to the respondent's level of education, 52.4% of respondents had bachelor's degrees, 39.6% had master's degrees, and 4% had M.Phil. and Ph.D. degrees. Regarding faculty management, with 59.1%, humanities with 5.3%, and science with 32.9%. According to the survey, 82.2% of respondents used the semester system, followed by 16% who used the annual plan, and 1.8% who used the trimester. However, the majority of respondents, 68.9% felt that digital learning was less effective than physical learning, 18.7% had a stronger impact, and 12.4% thought it was the same. This indicates that 68.9% of respondents agreed that while digital learning can be a good choice for many students, it is not always as successful as conventional learning methods like in-person interaction and unreliable networks. The Kaiser–Meyer–Olkin (KMO) and Bartlett's tests

explained that the overall final sample was adequate. The Kaiser–Meyer–Olkin (KMO) and Bartlett's tests are demonstrated in Table 1.

Table 1. KMO and Bartlett's Test to Analyze Adequate Sample

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.902
Bartlett's Test of Sphericity	Approx. Chi-Square	2869.876
	Df	153
	Sig.	0.000

Table 1 explains Bartlett's Test of Sphericity (Chi-square=2869.876) is significant (P-value=.000<0.05). KMO value is 0.902>0.70 indicating that the relationship between variables was statistically significant and appropriate for EFA to provide a parsimonious collection of factors. Principle component analysis of the extraction method also found all commonalities were greater than 0.05. Kaiser Criterion recommended extracting major four factors F1, F2, F3, F4, and F5 correspondingly extracted 48.271%, 58.120%, 66.656%, 72.765%, and altogether 76.587% of the total variance explained. Table 2 displays the factor loading matrix as a rotated component matrix for each variable to each of the connected structures.

Table 2. Rotated Component Matrix for Individual Level Items.

Component	1	2	3	4
CONV1	0.739			
CONV2	0.749			
CONV3	0.817			
CONV5	0.759			
TECH2		0.815		
TECH3		0.879		
TECH4		0.812		
TECH5		0.624		
IFAC1			0.774	
IFAC2			0.805	
IFAC3			0.793	
IFAC4			0.756	
STSA1				0.685
STSA2				0.731
STSA3				0.752
STSA4				0.741
STSA5				0.753
STSA6				0.740

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a Rotation converged in 6 iterations.

Table 2 explains that factor loading values greater than 0.50 were selected for the next level of analysis. The items were segregated into four essential elements, and the factor loading for each item within each component was evaluated. Reliability was improved by removing one item from the convenience construct CONV4 and another from technology TECH 1 of digital learning (Hair et al., 2010). Eliminating items from a scale or questionnaire increases its reliability by reducing error and ensuring that the items are measuring the things that need to be measured. Unstable items must be changed and retested to make sure they are stable. Since the starting point

for this suggested approach is a set of elements judged to be legitimately expressing the definition of the idea, improving rather than removing them is preferable.

The validity and reliability of the connections between the constructs are examined using a measurement model presented in Model Fit Summary Table 3. The goodness of fit indices evaluates the sufficiency of data.

Table 3. Goodness of Fit Statistics for Measurement Model of Digital Learning

Final Measurement Model	Fit indices							
	CMIN/ DF	GFI	AGFI	NFI	TLI	CFI	RMSEA	Sig.
Standard Fit of Model Indices (Fornell & Larcker, 1981; Gao et al., 2008; Kline, 2011)	<3	>0.80	>0.80	>0.80	>0.90	>0.90	<1	<0.05
Final obtained Indices for model fit	2.580	0.864	0.820	0.888	0.914	0.927	0.084	0.000

The goodness of fit model was evaluated with eight major indices. Table 3 explains that the model's obtained values fall within the range recommended by Fornell & Larcker (1981); Gao et al. (2008); and Kline (2011). The obtained values expressed in Table 3 are CMIN/*df* (minimum discrepancy divided by degrees of freedom 2.580<3), Goodness of Fit Index (GFI 0.864>0.80), adjusted goodness of fit index (AGFI 0.820>0.80), comparative fit index (CFI 0.927>0.90), Tucker–Lewis index (TLI 0.914>0.90), normed fit index (NFI >0.80), and root mean square error approximation (RMSEA 0.084<1). Therefore, it suggests measurement model of digital learning has fit indexes for further investigations (Cheng et al., 2023; Cheng, 2011; Hettiarachchi et al., 2021). Table 4 demonstrates the measurement model that the model's convergent validity has been attained.

Table 4 Standardized Factor Loadings, Average Variance Extracted, Maximum Shared Variance, and Composite Reliability

Constructs	Items	Standardized factor loading	CR	AVE	MSV	MaxR(H)
Convenience	CONV1	0.691	0.868	0.629	0.323	0.916
	CONV2	0.853				
	CONV3	0.789				
	CONV5	0.773				
Technology	TECH2	0.902	0.860	0.606	0.426	0.870
	TECH3	0.912				
	TECH4	0.688				
	TECH5	0.629				
Instructor Facility	IFAC1	0.873	0.926	0.758	0.548	0.932
	IFAC2	0.910				
	IFAC3	0.890				
	IFAC4	0.806				
Student Satisfaction	STSA1	0.718	0.898	0.596	0.549	0.903
	STSA2	0.728				
	STSA3	0.780				
	STSA4	0.774				
	STSA5	0.849				
	STSA6	0.775				

Table 4 shows the value of standardized factor loadings, average variance extracted, maximum shared variance, and composite reliability. The outcome reveals that each indicator's standardized factor loading was above 0.50 and ranged from 0.629 to 0.912. In addition, AVE

was used to assess the discriminant validity of the constructs (Hair et al., 2010). Its range from 0.596 to 0.758 was greater than 0.50, and MSV was lower than ASV, indicating no issues with discriminant validity for the constructs (Anderson & Srinivasan, 2003; Chou & Bentler, 2002). It also reported by Cheng (2011), Khan et al. (2020), and Soares et al. (2023) that each latent construct's average variance extracted (AVE) exceeds the threshold limit of 0.5. It affirms that strong convergent validity is present in the CFA measurement paradigm that was just discussed.

The final improved measurement model's path diagram is shown in Figure 2. The outcome reveals that each indicator's standardized factor loading was above 0.500 and ranged from 0.629 to 0.912. Rizun & Strzelecki (2020) also found a standardized factor loading value greater than 0.70. Figure 2 measurement model is presented graphically.

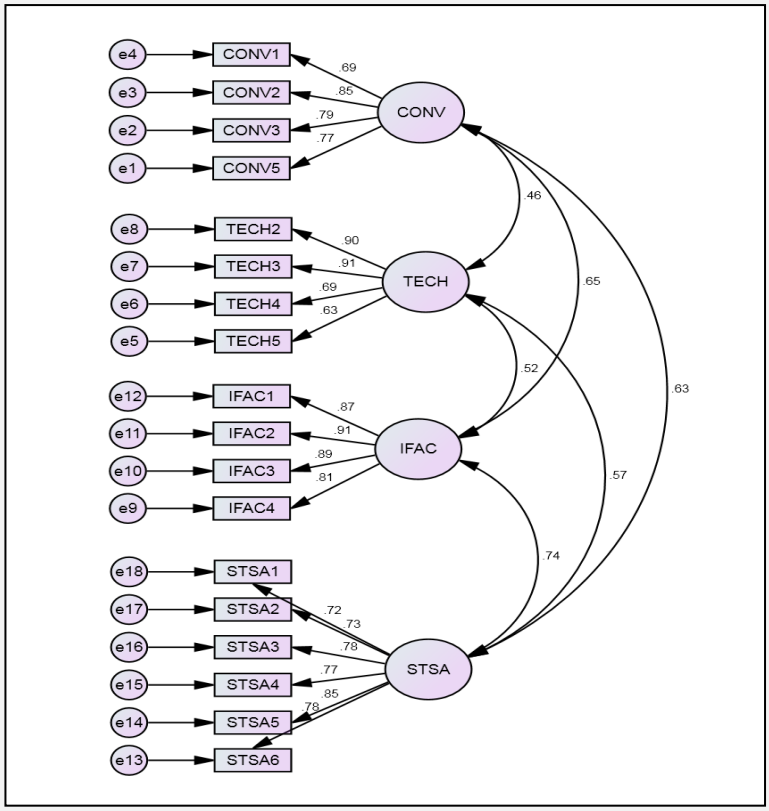

Figure 2. The measurement model

The square root of every factor's AVE was examined to make sure it was greater than the correlation between that factor and the other variables in the model, suggesting that there were no kind of discriminant validity issues (Chou & Bentler, 2002; Cheng et al., 2023; Khan et al., 2021). The square root of each variable is shown in Table 5.

Table 5. Discriminant validity

Constructs	TECH	CONV	IFAC	STSA
TECH	**0.793**			
CONV	0.457	**0.779**		
IFAC	0.519	0.653	**0.871**	
STSA	0.568	0.632	0.740	**0.772**

Table 5 shows all correlations between the measurement model's structures are statistically significant. Therefore, this study ensures the setting's nomological validity. Cheng et al. (2023), Cheng (2011), and Hettiarachchi et al. (2021) also found that all relationships between the

measurement model's structure and statistical significance are in the expected direction. The square root of the average variance extract (AVE) between each group of constructs was greater than the correlation obtained between factors, demonstrating the discriminantly valid of the constructs. Thus, the discriminant validity of the notions was established (Chou & Bentler, 2002). The results of the structural equation model are also shown in the graphical output.

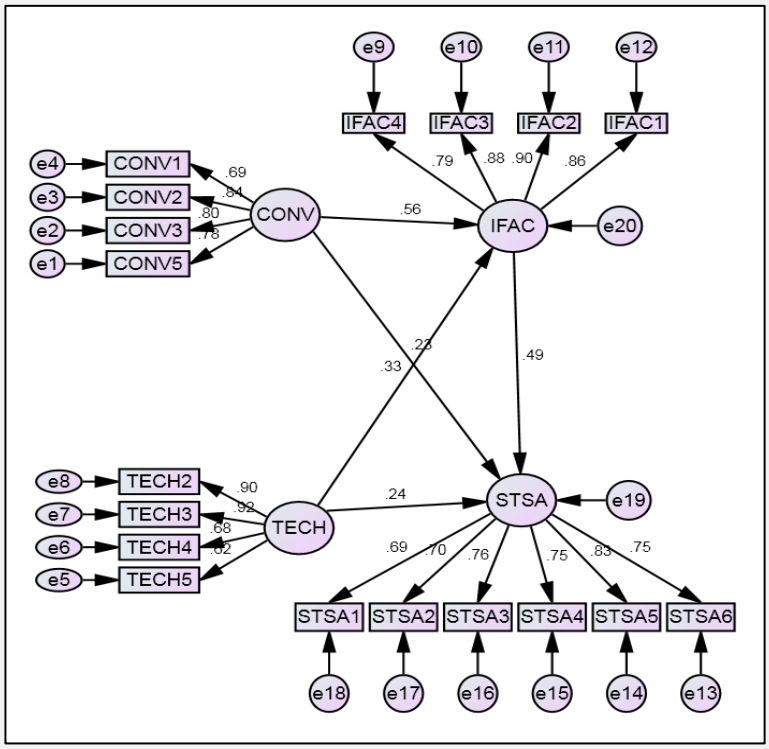

Figure 3. The structural model

In Figure 3, the graphical output is shown together with the outcomes of the structural equation model. Every path estimate is significant at the 1% significance level and points in the anticipated direction. Thus, path coefficients (β), critical ratios, and associated p-values can be used to assess the five study hypotheses which help to determine the student satisfaction level during COVID-19. The findings show that the structure model of digital learning constructs is a good predictor of student satisfaction.

Figure 3 presents the structural effect model of digital learning on student performance. This model explains the effects of digital learning on student performance during the COVID-19 epidemic. The results show that instructor facility (IFAC) strongly affects students' satisfaction. Also, compared to the measurement model, every model fit metric for the structural model has increased. Regression analysis helps to determine the highly influential factor and their significance level in Table 6.

Table 6. Standardized regression for research model

Description			Hypotheses	Estimate	P	Label
CONV	--->	IFAC	H_1	0.556	***	Significant
CONV	--->	STSA	H_2	0.231	0.002	Significant
TECH	--->	IFAC	H_3	0.333	***	Significant
TECH	--->	STSA	H_4	0.244	***	Significant
IFAC	--->	STSA	H_5	0.493	***	Significant

Table 6 shows each of the five hypotheses of the research can be tested through path coefficients (β) and corresponding p-values. The results show that instructor facility (IFAC) has the most substantial effect on student satisfaction. Cheng (2011) explained that instructors' active participation, quick responsiveness, and advice seem vital for student satisfaction. Since the teacher/instructor is a significant component of success in the e-learning environment.

Furthermore, the mediating construct IFAC has a highly influential dimension of students' satisfaction ($\beta = 0.493$; $p < 0.001$), which supports hypothesis five. Keržič et al. (2021) also found online instruction is one of the key factors affecting the quality of e-learning and, consequently, the perceived performance and student satisfaction. It also found convenience (CONV) ($\beta = 0.556$; $p < 0.001$) and technology (TECH) ($\beta = 0.333$; $p < 0.001$) have a significant and positive relationship with instructor facility. Similarly, convenience (CONV) ($\beta = 0.231$; $p < 0.005$) and technology (TECH) ($\beta = 0.244$; $p < 0.001$) have a significant and positive relationship with students' satisfaction. Cole et al. (2014) and Momen et al. (2023) also reported convenience had a greater impact on teacher facilities than student satisfaction because of the many other benefits that technology may offer students, such as personalization, access, learning pace, and learning outcomes through digital learning. Therefore, all hypotheses H_1 to H_5 supported. Momen et al. (2023) also supported the result of the study. The outcome also explained significant impact of convenience and technology on student satisfaction.

DISCUSSION

The COVID-19 epidemic has led to a rise in the adoption of digital learning in Nepal and throughout the globe (Jean-Louis, 2023; Shehzadi et al., 2020; Thapaliya et al., 2023). The sudden shift to online learning without sufficient planning or management of the required infrastructures, information-communication technology skills, and competencies resulted in several issues for instructors' and students' perspectives and attitudes (Alasagheirin et al., 2023; Ferrero et al., 2024; Sah, 2021; Thapaliya et al., 2023). Nepalese universities concentrated on gathering data about instructors and students for training purposes about Micro-Soft Team for digital teaching, learning, emailing, and carrying out any tasks associated with the institutions from their locality or native place (Gautam & Gautam, 2021; Sah, 2021; Thapaliya et al., 2023). Momen et al. (2023) found that universities plan to deliver online lectures, monitor attendance, administer tests, and evaluate students to facilitate digital learning.

The study's findings indicated that every construct had a substantial impact on both instructor facility and student satisfaction. Convenience was shown to have a greater influence on mediating factor instructor facility than technology. Redmond et al., (2018) discovered that a significant factor in understanding student motivation and participation is the facilities provided by instructors. Although there may be advantages for learners, there may also be drawbacks because many students still believe that traditional classroom instruction or face-to-face education is efficient (Alsayed & Althaqafi, 2022; Güngör, 2023). Therefore, educators ought to motivate students to participate in digital learning by offering support for technological infrastructure.

Additionally, Shishigu et al. (2024) discovered that technology was employed as a tool to improve students' learning. In addition to selecting online learning platforms, educational authorities and institutions should offer enough technical assistance to assist students in resolving potential internet and technological issues (Yan et al., 2021). Zuriah & Rahmandani (2021) also suggested universities should build digital learning mechanisms more strategically, creatively, and innovatively to enable systematic online education. The findings of the Momen et al. (2023) also revealed that schoolchildren's contentment with issues pertaining to technology and Internet infrastructure differs from that of university-level students. Regarding convenience and resource-related difficulties toward satisfaction, they continue to be consistent with the other two relationships. According to Aristovnik et al. (2020), students in Europe who were more optimistic and happier, more content with their academic work and lives, social science students, and those from higher-income families expressed greater satisfaction with the role of digital learning and university policies.

The outcome also revealed that technology had a greater impact on dependent construct student happiness than convenience. Perceived convenience and utility had a significant and positive impact on student satisfaction to increase academic performance reported by (Li et al., 2021; Rizun & Strzelecki, 2020; Samed Al-Adwan et al., 2020). It revealed that mediating construct instructor facility significantly affects student satisfaction. Lin et al. (2024) reported that Chinese students expect instructors in online courses to be more confident, creative, engaging, humble, actively promote class discussion and critical thinking, and be intellectually challenging. So, the effectiveness and efficiency of a digital transaction depend on the instructors' ability, digital devices and internet access with the simplicity of use, and technical support during or after post epidemic (Acharya et al.,2024; Hettiarachchi et al., 2021; Li et al., 2021; McCarthy & McCarthy, 2014; Sah, 2021; Soares et al., 2023; Xu & Xue, 2023). Consequently, the field of digital learning is transforming education by offering new opportunities for creativity, personalization, flexibility, and accessibility (Yadav, 2024).

CONCLUSION

The COVID-19 lockdown has severely disrupted activities related to university education. The findings demonstrate that instructor quality is the most influential factor in student satisfaction rather than other factors. The research also found that technology and convenience are other influential factors that influence instructor facility and student satisfaction.

Most students believe that instructor responsiveness, technical support, and convenience significantly and positively affect their satisfaction. The effectiveness of digital education, particularly during pandemics, depends on several factors such as teacher quality, student participation, technical support, and convenience. Thus, it can be concluded that the success of digital learning and student satisfaction is based on technological assistance, instructor support, learner efficacy, autonomy, style, and self-regulated learning. The transition from traditional classroom education to digital-assisted remote learning has been accelerated by the COVID-19 pandemic.

After the pandemic, the limitations of in-person instruction were partially removed, leading to a shift in the nature of digital learning environments. In post-pandemic circumstances, students can use digital learning systems to study in individualized ways by adjusting their time, place, environment, and pace. The mere act of sitting in front of a computer is insufficient. Students benefit from independence, engagement, and positive teacher-student relationships.

Implications of the study

The study offers theoretical, managerial, and social contributions to education. The research on digital education on student satisfaction at several universities provides contributions to formulating and implementing online education strategies. From the perspective of educational contributions, instructors and management teams must rethink their strategic actions with a focus on better conducting, planning, and realignment of their services, primarily the omnichannel perspective, to achieve student satisfaction in the pandemic situation. The experience, accessibility, and usability will be socially beneficial to the general public daily, but especially during a crisis. The study suggests that perceived risk thus aids in guiding authorities and economic recovery plans. A participative approach for social benefit to common human beings is a significant way that digital learning is transforming education. Higher education is easily and unhindered accessible to the entire people. The physical barriers that society faces in allowing their children to pursue higher education are not the same. An accessible online school can be accessed by several individuals from their primary home or place of care.

The report can help stakeholders at five major Nepali universities administrators and policymakers provide students with better digital classroom environments and facilities. The study's findings can also be useful to other stakeholders in their positions. Furthermore, this study can provide information on university facilities, instructor quality, technology circumstances, and educational standards for carrying out related research. In addition to traditional classroom

instruction, educational systems may continue to employ digital learning materials as study aids in a hybrid style during and after the COVID-19 pandemic passes.

Research limitations and future research directions

This study has various methodological restrictions, just like any other scientific investigation. There are just five university students in the sample. Consequently, using the suggested model, a more representative sample procedure, and a random selection of respondents, future research can be carried out in the settings of various universities. Therefore, future studies can be conducted in the different universities' contexts with the proposed model, with a more representative sampling process and a random selection of respondents. The proposed model does not consider every potential variable due to the time limit. Additionally, the study eschews moderating factors like socioeconomic status or internet accessibility as well as some recent constructs like student participation or institutional support. Thus, the study's limitations give future researchers a platform for additional investigation.

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Declaration of Conflicting Interests

The author has declared no potential conflicts of interest related to this manuscript's research, authorship, and/or publication

Research Ethics and Participant Consent

The author followed all research ethical criteria, thus no authorization from anybody else is required.

REFERENCES

Acharya, B. N., & Rana, K. (2024). How students and teachers voyaged from physical classroom to Emergency Remote Teaching in COVID-19 crisis: A case of Nepal. *E-Learning and Digital Media, 21*(2), 125-140. https://doi.org/10.1177/20427530231156166

Alasagheirin, M., Olsen, J. M., Mota, D., Lagunas, M., & Bogle, B. D. (2023). Examining students' online learning satisfaction during Covid-19 to inform post-pandemic program planning. *Nursing Reports, 13*(1), 327–336. https://doi.org/10.3390/nursrep13010031

Albelbisi, N. A., Al-Adwan, A. S., & Habibi, A. (2021). Impact of quality antecedents on satisfaction toward MOOC. *Turkish Online Journal of Distance Education, 22*(2), 164–175. https://doi.org/10.17718/tojde.906843

Aldhafeeri, F. M., & Alotaibi, A. A. (2023). Reimagining Education for Successful and Sustainable Digital Shifting. *SAGE Open, 13*(1), 1–20. https://doi.org/10.1177/21582440231154474

Alsayed, R. A., & Althaqafi, A. S. A. (2022). Online learning during the Covid-19 pandemic: benefits and challenges for EFL students. *International Education Studies, 15*(3), 122–129. https://doi.org/10.5539/ies.v15n3p122

Alsoud, A. R., & Harasis, A. A. (2021). The impact of Covid-19 pandemic on student's e-learning experience in Jordan. *Journal of Theoretical and Applied Electronic Commerce Research, 16*(5), 1404–1414. https://doi.org/10.3390/jtaer16050079

Anderson, R. E., & Srinivasan, S. S. (2003). E-satisfaction and e-loyalty: A contingency framework. *Psychology and Marketing, 20*(2), 123–138. https://doi.org/10.1002/mar.10063

André, Q. (2022). Outlier exclusion procedures must be blind to the researcher's hypothesis. *Journal of Experimental Psychology: General, 151*(1), 213–223. https://doi.org/10.1037/xge0001069

Aristovnik, A., Keržič, D., Ravšelj, D., Tomaževič, N., & Umek, L. (2020). Impacts of the COVID-19 pandemic on life of higher education students: A global perspective. *Sustainability, 12*(20), 8438. https://doi.org/10.3390/su12208438

Azhari, T., & Kurniawati. (2021). Students' perception on online learning during the Covid-19 pandemic: A case study of Universitas Malikussaleh students. In *Proceedings of the International Conference on Social Science, Political Science, and Humanities (ICoSPOLHUM 2020), 495*, 46–50. https://doi.org/10.2991/assehr.k.210125.009

Babalola, E. O., Adeyoola, I. A., & Omolafe, E. V. (2023). Virtual Learning as A Determinant of Students Academic Performance in University of Ilorin During COVID-19 Pandemic. *Journal of Digital Learning and Education, 3*(3), 243–253. https://doi.org/10.52562/jdle.v3i3.593

Barbour, M. K. (2006). Book review of Virtual schools: Planning for success. *Quarterly Review of Distance Education, 7*(2), 215-217.

Baruch, Y., & Holtom, B. C. (2008). Survey response rate levels and trends in organizational research. *Human Relations, 61*(8), 1139–1160. https://doi.org/10.1177/0018726708094863

Basnet, S., Basnet, H. B., & Bhattarai, D. K. (2021). Challenges and opportunities of online education during Covid-19 Situation in Nepal. *Rupantaran: A Multidisciplinary Journal, 5*, 89–99. https://doi.org/10.3126/rupantaran.v5i01.39867

Bhakta, K. (2017). Using social networking sites and its impact on college students. *International Journal for Innovative Research in Multidisciplinary Field, 3*(1), 12–18.

Bhattacherjee, A. (2012). Social science research principles, methods, and practices' 2nd ed., USA:University of South Florida. http://scholarcommons.usf.edu/cgi/viewcontent.cgi?article=1002andcontext=oa_textbooks [Accessed on 12 October 2020].

Butnaru, G. I., Niță, V., Anichiti, A., & Brînză, G. (2021). The effectiveness of online education during Covid 19 pandemic—A comparative analysis between the perceptions of academic students and high school students from Romania. *Sustainability, 13*(9), 1–20. https://doi.org/10.3390/su13095311

Chaudhary, G., Khadka, R., Lamichhane, A., Dhakal, B., Das, N., Tharu, N., Karki, K., & Pandey, J. (2022). Impact of Covid-19 pandemic on learning status of student in Nepal. *Journal of Education and Health Promotion, 11*(1), 1-8. https://doi.org/10.4103/jehp.jehp_354_22

Cheng, X., Bao, Y., Yang, B., Chen, S., Zuo, Y., & Siponen, M. (2023). Investigating students' satisfaction with online collaborative learning during the COVID-19 period: An expectation-confirmation model. *Group Decision and Negotiation, 32*, 749-778. https://doi.org/10.1007/s10726-023-09829-x

Cheng, Y. M. (2011). Antecedents and consequences of e-learning acceptance: Antecedents and consequences of e-learning acceptance. *Information Systems Journal, 21*(3), 269–299. https://doi.org/10.1111/j.1365-2575.2010.00356.x

Chitkushev, L., Vodenska, I., & Zlateva, T. (2014). Digital learning impact factors: Student satisfaction and performance in online courses. *International Journal of Information and Education Technology, 4*(4), 356–359. https://doi.org/10.7763/IJIET.2014.V4.429

Chou, C. P., & Bentler, P. M. (2002). Model modiÿcation in structural equation modeling by imposing constraints. *Computational Statistics & Data Analysis, 41*, 271–287.

Cicha, K., Rizun, M., Rutecka, P., & Strzelecki, A. (2021). Covid-19 and higher education: first-year students' expectations toward distance learning. *Sustainability, 13*(4), 1–19. https://doi.org/10.3390/su13041889

Cole, M. T., Shelley, D. J., & Swartz, L. B. (2014). Online instruction, e-learning, and student satisfaction: A three year study. *The International Review of Research in Open and Distributed Learning, 15*(6), 112–131. https://doi.org/10.19173/irrodl.v15i6.1748

Coman, C., Țîru, L. G., Meseșan-Schmitz, L., Stanciu, C., & Bularca, M. C. (2020). Online teaching and learning in higher education during the coronavirus pandemic: Students' perspective. *Sustainability, 12*(24), 1–24. https://doi.org/10.3390/su1224103

Cooper, D.R., & Schindler, P. S. (2014). *Business Research Methods, 12th Edition*. McGraw Hill International Edition, New York.

DeMaio, T. J. (1980). Refusals: Who, where and why. *Public Opinion Quarterly, 44*(2), 223-233. https://doi.org/10.1086/268586

Dawadi, S., Giri, R., & Simkhada, P. (2020). Impact of Covid -19 on the education sector in Nepal - Challenges and coping strategies. *Sage Submission*, 1–16 [Preprint]. https://doi.org/10.31124/advance.12344336.v1

Ferrero, A. M., & Álvarez Sainz, M. (2024). Attitudes of university students towards traditional face-to-face learning systems and learning with ICT. *E-Learning and Digital Media, 21*(2), 180-200. https://doi.org/10.1177/20427530231156185

Filip, R., Gheorghita Puscaselu, R., Anchidin-Norocel, L., Dimian, M., & Savage, W. K. (2022). Global challenges to public health care systems during the COVID-19 pandemic: A review of pandemic

measures and problems. *Journal of Personalized Medicine, 12*(8), 1–22. https://doi.org/10.3390/jpm12081295

Fornell, C., & Larcker, D. F. (1981). Structural equation models with unobservable variables and measurement error: Algebra and Statistics. *Journal of Marketing Research, 18*(3), 382–388. https://doi.org/10.2307/3150980

Gao, S., Mokhtarian, P. L., & Johnston, R. A. (2008). Nonnormality of data in structural equation models. *Transportation Research Record: Journal of the Transportation Research Board, 2082*(1), 116–124. https://doi.org/10.3141/2082-14

Gautam, D. K., & Gautam, P. K. (2021). Transition to online higher education during Covid -19 pandemic: turmoil and way forward to developing country of South Asia-Nepal. *Journal of Research in Innovative Teaching & Learning, 14*(1), 93–111. https://doi.org/10.1108/JRIT-10-2020-0051

Gautam, D. K., & Sah, G. K. (2023). Online Banking Service Practices and Its Impact on E-Customer Satisfaction and E-Customer Loyalty in Developing Country of South Asia-Nepal. *SAGE Open, 13*(3), 1–14. https://doi.org/10.1177/21582440231185580

Gharti, L. (2023). Challenges of online learning in the post Covid-19 era: Lived experiences of teachers in remote Nepal. *English Language Teaching Perspectives, 8*(1–2), 80–96. https://doi.org/10.3126/eltp.v8i1-2.57861

Güngör, C. (2023). Socially and Educationally Distanced: Examining the Views of University Students. *SAGE Open, 13*(2), 1–13. https://doi.org/10.1177/21582440231173664

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate data analysis (7th ed.).* Prentice Hall.

Hamal, J. B. (2021). Impact of social media on academic performance of graduate students in Kathmandu. *Interdisciplinary Journal of Management and Social Sciences, 2*(2), 37–49. https://doi.org/10.3126/ijmss.v2i2.42600

Hettiarachchi, S., Damayanthi, B., Heenkenda, S., Dissanayake, D., Ranagalage, M., & Ananda, L. (2021). Student satisfaction with online learning during the covid-19 pandemic: A study at state universities in Sri Lanka. *Sustainability, 13*(21), 1–24. https://doi.org/10.3390/su132111749

Imsa-ard, P. (2020). Thai university students' perceptions towards the abrupt transition to 'forced' online learning in the Covid -19 situation. *Journal of Education Khon Kaen University, 43*(3), 30–44.

Jean-Louis, M. (2023). Marketing online and distance learning. In O. Zawacki-Richter & I. Jung (Eds.), *Handbook of Open, Distance and Digital Education* (pp. 605–621). Springer Nature Singapore. https://doi.org/10.1007/978-981-19-2080-6_33

Keržič, D., Alex, J. K., Pamela Balbontín Alvarado, R., Bezerra, D. da S., Cheraghi, M., Dobrowolska, B., Fagbamigbe, A. F., Faris, M. E., França, T., González-Fernández, B., Gonzalez-Robledo, L. M., Inasius, F., Kar, S. K., Lazányi, K., Lazăr, F., Machin-Mastromatteo, J. D., Marôco, J., Marques, B. P. (2021). Academic student satisfaction and perceived performance in the e-learning environment during the Covid-19 pandemic: Evidence across ten countries. *PLoS ONE, 16*(10), 1–23. https://doi.org/10.1371/journal.pone.0258807

Kline, R. B. (2011). *Principles and practice of structural equation modeling (3rd ed).* Guilford Press.

Khan, M. A., Kamal, T., Illiyan, A., & Asif, M. (2021). School students' perception and challenges towards online classes during Covid-19 pandemic in India: An econometric analysis. *Sustainability, 13*(9), 1–15. https://doi.org/10.3390/su13094786

Khan, M. A., Vivek, V., Nabi, M. K., Khojah, M., & Tahir, M. (2020). Students' perception towards e-learning during Covid-19 pandemic in India: An Empirical Study. *Sustainability, 13*(1), 1–14. https://doi.org/10.3390/su13010057

Li, A., Islam, A. Y. M. A., & Gu, X. (2021). Factors Engaging College Students in Online Learning: An Investigation of Learning Stickiness. *SAGE Open, 11*(4), 1–15. https://doi.org/10.1177/21582440211059181

Li, B., Guan, Q., He, Z., Luo, W., & Zhu, X. (2021). Measuring the satisfaction of participants in online learning during the Covid-19 pandemic: A large-scale analysis. *Open Journal of Social Sciences, 09*(12), 396–424. https://doi.org/10.4236/jss.2021.912027

Lin, X., Huang, M., & Lin, Q. (2024). Students' expectations of instructors in face-to-face and online learning environments at a Chinese university. *E-Learning and Digital Media, 21*(2), 160-179. https://doi.org/10.1177/20427530231156482

McCarthy, R. V., & McCarthy, M. M. (2014). Student perception of social media as a course tool. *Information Systems Education Journal (ISEDJ), 12*(2), 38–46.

Mollah, A. H., & Parvin, S. (2020). Online higher education during Covid-19 pandemic in Bangladesh: Benefits, problems and prospects. *Journal of International Politics, 2*(4), 23–28.

Momen, M. A., Sultana, S., Hoque, Md. A., Shahriar, S. H. B., & Ashif, A. S. M. (2023). Determinants of students' satisfaction with digital classroom services: Moderating effect of students' level of study. *Asian Association of Open Universities Journal, 18*(2), 160–175. https://doi.org/10.1108/AAOUJ-09-2022-0124

Monika, Y., & Kristanto, S. B. (2024). Adapting education: Navigating hybrid classrooms in the post-pandemic era. *Journal of Digital Learning and Education, 4*(2), 156–166. https://doi.org/10.52562/jdle.v4i2.1275

Muthuprasad, T., Aiswarya, S., Aditya, K. S., & Jha, G. K. (2021). Students' perception and preference for online education in India during Covid-19 pandemic. *Social Sciences & Humanities Open, 3*(1), 1–11. https://doi.org/10.1016/j.ssaho.2020.100101

Nadeak, B. (2020). The effectiveness of distance learning using social media during the pandemic period of Covid-19: A case in universitas kristen Indonesia. *International Journal of Advanced Science and Technology, 29*(7), 1764–1772.

Nayak, B., Bhattacharyya, S. S., Goswami, S., & Thakre, S. (2022). Adoption of online education channel during the Covid-19 pandemic and associated economic lockdown: an empirical study from push–pull-mooring framework. *Journal of Computers in Education, 9*(1), 1–23. https://doi.org/10.1007/s40692-021-00193-w

Nepal, A. (2020). Online classes in Tribhuvan University: Opportunities and challenges. *Rupantaran: A Multidisciplinary Journal, 4*(1), 20–30. https://doi.org/10.3126/rupantaran.v4i1.34014

Neuwirth, L. S., Jović, S., & Mukherji, B. R. (2021). Reimagining higher education during and post- Covid-19: Challenges and opportunities. *Journal of Adult and Continuing Education, 27*(2), 141–156. https://doi.org/10.1177/1477971420947738

Nikou, S., & Maslov, I. (2023). Finnish university students' satisfaction with e-learning outcomes during the COVID-19 pandemic. *International Journal of Educational Management, 37*(1), 1–21. https://doi.org/10.1108/IJEM-04-2022-0166

Oyarzun, B., Barreto, D., & Conklin, S. (2018). Instructor social presence effects on learner social presence, achievement, and satisfaction. *TechTrends, 62*(6), 625–634. https://doi.org/10.1007/s11528-018-0299-0

Paudel, P. (2020). Online education: benefits, challenges and strategies during and after Covid-19 in higher education. *International Journal on Studies in Education, 3*(2), 70–85. https://doi.org/10.46328/ijonse.32

Poudel, K., & Subedi, P. (2020). Impact of Covid-19 pandemic on socioeconomic and mental health aspects in Nepal. *International Journal of Social Psychiatry, 66*(8), 748–755. https://doi.org/10.1177/0020764020942247

Rahayu, S., Rahmadani, E., Syafitri, E., Prasetyoningsih, L. S. A., Ubaidillah, M. F., & Tavakoli, M. (2022). Teaching with technology during Covid-19 pandemic: An interview study with teachers in Indonesia. *Education Research International, 2022*, 1–9. https://doi.org/10.1155/2022/7853310

Rawal, S., (2023). *The impact of information technology in higher education: A sociological analysis.* Tribhuvan University Annual Publication, 92-102. ISSN:2795-1650.

Redmond, P., Heffernan, A., Abawi, L., Brown, A., & Henderson, R. (2018). An Online Engagement Framework for Higher Education. *Online Learning, 22*(1), 182–204. https://doi.org/10.24059/olj.v22i1.1175

Rizun, M., & Strzelecki, A. (2020). Students' acceptance of the Covid-19 Impact on shifting higher education to distance learning in Poland. *International Journal of Environmental Research and Public Health, 17*(18), 1–19. https://doi.org/10.3390/ijerph17186468

Rogelberg, S. G., & Stanton, J. M. (2007). Introduction: Understanding and dealing with organizational survey nonresponse. *Organizational research methods, 10*(2), 195-209. https://doi.org/10.1177/1094428106294693

Sah, G. K. (2021). Students' perception towards online learning at university during COVID-19 in Nepal. *Patan Pragya, 8*(01), 95–107. https://doi.org/10.3126/pragya.v8i01.42424

Sah, G. K., Gupta, D. K., & Yadav, A. P. (2024). Analysis of ChatGPT and the future of artificial intelligence: Its effect on teaching and learning. *Journal of AI, Robotics & Workplace Automation, 3*(1), 64-80.

Samed Al-Adwan, A., Awni Albelbisi, N., Hasan Aladwan, S., Horani, O., Al-Madadha, A., & Hamdi Al Khasawneh, M. (2020). Investigating the impact of social media use on student's perception of

academic performance in higher education: Evidence from Jordan. *Journal of Information Technology Education: Research, 19*, 953–975. https://doi.org/10.28945/4661

Samed Al-Adwan, A., & Khdour, N. (2020). Exploring student readiness to MOOCs in Jordan: A structural equation modelling approach. *Journal of Information Technology Education: Research, 19*, 223–242. https://doi.org/10.28945/4542

Saunders, M., Lewis, P., & Thornhill, A. (2003). *Research Methods for Business Students (3rd ed.)*. England: Prentice Hall.

Sekaran, U., & Bougie, R. (2016). *Research Methods for Business: A Skill-Building Approach, 7th ed*. Wiley and Sons, West Sussex.

Sharma, K., Banstola, A., & Parajuli, R. R. (2021). Assessment of Covid-19 pandemic in Nepal: A lockdown scenario analysis. *Frontiers in Public Health, 9*, 1–12. https://doi.org/10.3389/fpubh.2021.599280

Sharma, K., Deo, G., Timalsina, S., Joshi, A., Shrestha, N., & Neupane, H. C. (2020). Online learning in the face of Covid-19 pandemic: Assessment of students' satisfaction at Chitwan medical college of Nepal. *Kathmandu University Medical Journal, 18*(2), 40–47. https://doi.org/10.3126/kumj.v18i2.32943

Shehzadi, S., Nisar, Q. A., Hussain, M. S., Basheer, M. F., Hameed, W. U., & Chaudhry, N. I. (2020). The role of digital learning toward students' satisfaction and university brand image at educational institutes of Pakistan: a post-effect of COVID-19. *Asian Education and Development Studies, 10*(2), 276–294. https://doi.org/10.1108/AEDS-04-2020-0063

Shishigu, A., Michael, K., & Atnafu, M. (2024). Effect of blended learning on mathematical achievement and anxiety: A context-based technology integration for meaningful learning. *E-Learning and Digital Media*, 20427530241241767. https://doi.org/10.1177/20427530241241767

Soares, J. C., Limongi, R., De Sousa Júnior, J. H., Santos, W. S., Raasch, M., & Hoeckesfeld, L. (2023). Assessing the effects of Covid-19-related risk on online shopping behavior. *Journal of Marketing Analytics, 11*(1), 82–94. https://doi.org/10.1057/s41270-022-00156-9

Tanius, E. (2020). University students' self-efficacy in online learning due to Covid-19. *International Journal of Innovative Research in Engineering & Multidisciplinary Physical Sciences, 8*(6), 107–113. https://doi.org/10.37082/IJIRMPS.2020.v08i06.011

TarnnumRahimoddin, S., Reena, D., MahejabinDildar, D. S., Shalu, D., & Panda, R. C. (2021). Online education impact and importance during Covid-19 with reference to rural India. *Turkish Online Journal of Qualitative Inquiry (TOJQI), 12*(10), 3222–3233.

Thapaliya, M., Adhikari, S., & Rana, L. (2024). Opportunity in COVID-19 crisis: Moving away from chalk and talk to technology-integrated teaching in Nepalese higher education institutions. *E-Learning and Digital Media, 21*(1), 87-105. https://doi.org/10.1177/20427530231153944

Thomas, D. (2020). Thailand university students' e-learning behavior during the global pandemic. *Human Behavior, Development and Society, 21*(4), 56–65.

Tulza, K. C. (2020). Impact of Covid-19 on university education, Nepal. *Tribhuvan University Journal, 35*(2), 34–46. https://doi.org/10.3126/tuj.v35i2.36187

UGC. (2016), *Education Management Information System: Report for higher Education*. University Grants Commission (UGC), Bhaktapur, Nepal.

UGC. (2021). *Education Management Information System: Report for higher Education*. University Grants Commission (UGC), Bhaktapur, Nepal.

UNESCO. (2020). *Global monitoring of school closures caused by COVID-19*. Available at: https://en.unesco.org/covid19/educationresponse

Upadhyay, H. P., & Sedain, P. (2019). Impact and perception of social networking sites on academic performance of medical students. *Journal of College of Medical Sciences-Nepal, 15*(2), 119–124. https://doi.org/10.3126/jcmsn.v15i2.23838

Wright, G., Volodarsky, S., Hecht, S., & Saxe, L. (2023). Student satisfaction and the future of online learning in higher education: Lessons from a natural experiment. *Online Learning, 27*(1), 336–355. https://doi.org/10.24059/olj.v27i1.3224

Xu, T., & Xue, L. (2023). Satisfaction with online education among students, faculty, and parents before and after the Covid-19 outbreak: Evidence from a meta-analysis. *Frontiers in Psychology, 14*, 1–13. https://doi.org/10.3389/fpsyg.2023.1128034

Yadav, N. (2024). The Impact of Digital Learning on Education. *International Journal of Multidisciplinary Research in Arts, Science and Technology, 2*(1), 24–34. https://doi.org/10.61778/ijmrast.v2i1.34

Yan, L., Whitelock-Wainwright, A., Guan, Q., Wen, G., Gašević, D., & Chen, G. (2021). Students' experience of online learning during the Covid-19 pandemic: A province-wide survey study. *British Journal of Educational Technology*, 52(5), 2038-2057. https://doi.org/10.1111/bjet.13102

Zuriah, N., & Rahmandani, F. (2021). Analysis of online learning implementation and student learning activities in the Covid-19 pandemic era and its problems. In *Proceedings of the 1st International Conference on Character Education* (ICCE 2020), Semarang, Indonesia. https://doi.org/10.2991/assehr.k.210204.026