

Psychometric Analysis of Students and Faculty towards Online and Offline Education

Swati Raj¹, Vishes Mishra², Bhavana Sharma³, Vaishali Gupta⁴ & Priyanka Mudgal⁵

^{1,4}Assistant Professor, G.L. Bajaj Institute of Technology & Management, Greater Noida

^{2,3}Assistant Professor, Lloyd Institute of Management & Technology, Greater Noida

⁵Assistant Professor, Trinity Institute on Innovation & Professional Studies, Greater Noida

Abstract:

The rapid advancement of technology and the unprecedented disruption caused by the COVID-19 pandemic have significantly altered the educational landscape, requiring a transition from traditional in-person instruction to digital platforms. This study examines the impact, effectiveness, and suitability of online versus offline learning among students and faculty in higher education. This study employs primary data collected through structured questionnaires from 230 students and 77 faculty members across diverse disciplines, utilizing ANOVA and regression analysis to evaluate variables such as age, gender, familiarity with digital platforms, course stream, and educational level. The results indicate significant differences in perceived suitability and comfort between online and offline learning methods. While offline learning was considered more acceptable and comfortable for both students and teachers, online learning showed greater adaptability among younger participants and those with advanced digital literacy. Faculty members indicated heightened challenges in delivering effective online training, especially regarding interaction and participation. The study revealed that acquaintance with conventional teaching methods positively influenced learning outcomes and comfort levels more than familiarity with online methods. The findings have substantial implications for educational policy, highlighting the need for blended learning models, targeted digital training for teachers, and enhancements to infrastructure to address the digital divide. This study advances the current literature on technology-mediated education and provides practical recommendations for institutions aiming to align innovation with pedagogical effectiveness.

Keywords: Online and Offline learning, Regression, ANOVA, Psychological variables, Suitability, Learning Experience, Comfortability

Introduction

The key to success is in education. The acquisition of information and education is an essential requirement for every individual. Education facilitates personal development. It fosters our ability to assess and differentiate between what is morally right and wrong, and in reality, it contributes to our personal growth. Nowadays, individuals are evaluated based on their level of education. Good education is widely regarded as a result of good employment opportunities. According to the World Bank Statistical Report on Development (2021), 64.61% of the population resides in rural areas, and a significant portion lacks education. Various initiatives spearheaded by the government, NGOs, and corporations aim to eliminate illiteracy to advance our nation. The notion of education grounded on offline methods of teaching remained captivating for some years until the eighteenth century, but online education became mainstream.

(Veeraiyan et al. 2022). The convergence of globalization and the COVID-19 pandemic has led to an abrupt transition from offline to online classroom teaching. Offline teaching, often known as conventional classroom teaching, refers to the method of education that operated before the Internet age, with minimal or no use of information technology (Pei & Wu, 2019). An online instructional platform, or contemporary teaching, also known as online teaching, transcends time and location constraints. Both instructors and students fulfil their responsibilities according to their schedules and interests (Pei & Wu, 2019). As per Allen and Seaman (2003), an online learning course is an educational program in which most or all of the material is presented online. Chang et al. (2021) conducted a comparative analysis of the efficacy of learning in a conventional classroom environment with that of learning implemented through online platforms to assess and enhance the quality of learning. An investigation among students studying both modes of education revealed that the efficacy of learning through online classes was greater than that of learning in a typical classroom. As we know, much emphasis has been placed on online education in the changing world of the internet. This is because technological change has given birth to a revolution, which has given a new twist to the revolution of education. By combining these two, a new era of innovation has begun. This type of change in technological path has mostly been seen after COVID-19. New developments in science and technology have led to the widespread implementation of web-based E-learning in contemporary business education, culminating in 2020 when the COVID-19 pandemic triggered the cessation of in-person instruction across all educational institutions. Traditionally, E-learning, such as video lectures, primarily functions as an adjunct to in-person instruction and is less effective in addressing specific issues, stimulating student engagement, and aligning with course objectives. Throughout the COVID-19 epidemic, most online instruction replicated offline teaching methodologies by incorporating features such as screen sharing, attendance verification, "raising hands," and "quizzes," among others.

The assessment of online teaching satisfaction is an activity that examines the effectiveness of the teaching process and outcomes in relation to educational goals, providing information that can be used to inform pedagogical decision-making. A value assessment is a procedure that involves evaluating the actual or predicted value of instructional activities (that is, the teaching of faculty and the learning that takes place among students). The following represents the evaluation of students' satisfaction levels with online instruction. To analyze all aspects of education and identify its standard, level, effectiveness, and weaknesses, it is necessary to conduct a comprehensive and impartial evaluation of the teaching effect. The evaluation of teaching satisfaction, analogous to a physical examination, constitutes a comprehensive and empirical study of education. Faculties and students alike can benefit from assessing teaching satisfaction, which can be used to strengthen and support both parties. The evaluation provides information about the effectiveness of the teachers as well as the academic achievements of the students receiving instruction. On the basis of the opinions that were gathered, both teachers and students can change and improve the instructional plan.

This research paper is organized into seven parts. Part one deals with the introduction of a research paper. Part two is related to the theoretical framework and chronological research. Part three is for the rationale of the study, and Part four is for the materials and methods. Part five is

for results and discussions. Part six is for the conclusion of the research study, and Part seven is for the policy implementations of the research study.

2. Theoretical Pinning

Classroom teaching is termed in-person instruction within a physical classroom setting. Course instruction predominantly focuses on the instructor's lectures in a conventional face-to-face teaching format, with students utilizing the remaining classroom time for practical and group activities. Assessment is impartial in the context of in-person education. It is typically executed in an organized fashion under the oversight of educators. This impairs students' cognitive processes and hinders their future capabilities. Students from the Asian region exhibit a greater preference for face-to-face learning than for online or offline learning. Participants find face-to-face sessions conducive to comfort, as they offer immediate resolutions to their issues and practical engagement. Student satisfaction with in-person learning exceeded that of online learning. Conversely, data indicate that students expressed greater satisfaction with online learning than with in-person instruction. The organizational paradigm of online learning parallels that of traditional face-to-face learning. This paper's methodology adhered to the well-defined concept of combining individual technological access with personal online instruction and acquiring courses and skills. This concept involves providing students with the necessary technological tools and resources for online learning and personalized online instruction to guide them through the learning process. The offline learning approach combines traditional in-person teaching sessions with academic research in a classroom setting. This study provides a comparative framework for offline and online learning and teaching, with practical implications for faculty and policymakers. Furthermore, this research also emphasizes the significance of context-related variables when developing online versus offline teaching and learning frameworks. Specific learners prefer the conventional face-to-face learning method and consider the in-person element an essential aspect of their learning process. Supplementary materials and additional interaction possibilities are crucial in enhancing student understanding, synthesis, and application of course information for qualitative tasks, including content integration and synthesis, such as research articles. This highlights the potential for improvement in the learning process. Furthermore, face-to-face connection enhances students' chances of social presence and peer engagement.

2.1 Online Education

Web-based learning progress, also known as online learning, aims to provide traditional classroom educational content via the Internet. Online learning presents the greatest hurdles, followed by distance learning, and subsequently, blended learning. Online learning is defined as the acquisition of instructional content via the Internet or electronic technologies. Students can engage and interact with teachers and peers from any location in a virtual setting. Online learning has gained prominence due to its ability to offer flexible access to educational content and instruction at any time and from any location. It employs educational materials, including PowerPoint presentations, lectures, documents, images, and videos, to establish an autonomous learning environment for students. Technological advancements now enable simultaneous teaching and learning across several online locations. Online learning addresses the challenges inherent in traditional education; nonetheless, it also introduces certain issues, such as isolation,

distance, insufficient feedback, detachment from peers, and a lack of commitment. A research study indicated that 89% of students deemed practical training via an online delivery method as inadvisable. In this crucial circumstance, blended learning has evolved as a response to the challenges encountered in both modalities, encompassing online and in-person instruction. Training courses are classified as online when 80% of the training material is provided digitally. Online learning presents challenges due to its inherent remoteness, compounded by insufficient electronic resources and inconsistent Internet connectivity.

2.2 Offline Education

Offline study, often known as self-study, enables students to acquire foundational information for application in both online and in-person sessions. Self-study modules, printed materials, and learning media derived from the surrounding environment exemplify offline learning. Teachers provide students with modules, notes, and assignments for offline learning. Furthermore, emphasized the online, offline, and mixed learning methodologies, seeing a paradigm shift due to swift and continuous technological progress.

Table 1: Chronological Studies about Online and Offline Learning

<i>Author</i>	<i>Year</i>	<i>Variables Used</i>	<i>Statistical Tools</i>	<i>Findings</i>
<i>Davis</i>	1989	User acceptance, technology adoption	Factor analysis	Proposed the Technology Acceptance Model, indicating that perceived ease of use and usefulness affect technology adoption.
<i>Rovai</i>	2002	Sense of community, student motivation	Structural Equation Modeling (SEM)	Demonstrated that a strong sense of community enhances student motivation in both online and offline environments.
<i>Garrison</i>	2011	Critical thinking, engagement levels	Mixed methods	Found that critical thinking is enhanced through structured online discussions.
<i>Allen & Seaman</i>	2019	Enrollment trends, course completion rates	Statistical analysis	Noted a consistent increase in online course enrollment, with completion rates improving over time.
<i>Muilenburg & Berge</i>	2019	Barriers to online learning, accessibility	Qualitative analysis	Identified key barriers to online learning, including technological issues and a lack of support.
<i>Garrison, Anderson, & Archer</i>	2020	Cognitive presence, social presence, teaching presence	Content analysis, descriptive statistics	Identified that all three presences are critical for effective online learning environments.

<i>Knowles</i>	2020	Self-directed learning, learner autonomy	Qualitative analysis	Highlighted that online education fosters greater learner autonomy compared to traditional settings.
<i>Baker</i>	2020	Teaching presence, student satisfaction	ANOVA	Found significant correlations between teaching presence and student satisfaction in online courses.
<i>Venkatesh & Bala</i>	2020	Perceived usefulness, perceived ease of use	Path analysis	Confirmed that perceived usefulness significantly influences the acceptance of online education technologies.
<i>Brusilovsky & Millán</i>	2020	User modeling, adaptive learning	Case studies, qualitative analysis	Discussed how adaptive learning technologies improve student outcomes in online education.
<i>Hwang & Chang</i>	2020	Engagement, interaction quality	SEM	Highlighted that high-quality interaction in online courses significantly enhances student engagement.
<i>Kuo et al.</i>	2020	Motivation, online learning effectiveness	Structural Equation Modeling (SEM)	Found that motivation significantly mediates the relationship between online learning environments and effectiveness.
<i>Alharbi & Drew</i>	2020	Student readiness, online learning effectiveness	Descriptive statistics	Found that students' readiness for online learning significantly affects their success in online courses.
<i>Joo et al.</i>	2020	Online learning anxiety, academic performance	Correlation analysis	Found that online learning anxiety negatively impacts academic performance.
<i>Hsieh et al.</i>	2020	Learning outcomes, teaching methods	ANOVA	Identified that interactive teaching methods in online courses lead to better learning outcomes.
<i>Lee et al.</i>	2020	Self-efficacy, online learning performance	Regression analysis	Showed that higher self-efficacy in using technology leads to better performance in online courses.
<i>Tinto</i>	2021	Student engagement, retention rates	Regression analysis	Emphasized the importance of social integration for student retention in offline settings.

<i>Almarashdeh et al.</i>	2021	Learning outcomes, student satisfaction	Descriptive statistics, surveys	Found that students in online environments reported similar or higher satisfaction compared to traditional classes.
<i>Zhao et al.</i>	2021	Academic performance, learning styles	Meta-analysis	Identified that online learning can be equally effective as offline learning, depending on the learning style of students.
<i>Lee & Choi</i>	2021	Satisfaction, learning outcomes	Correlation analysis	Demonstrated that learner satisfaction positively correlates with learning outcomes in both online and offline settings.
<i>Hwang et al.</i>	2021	Learning strategies, technology use	ANOVA	Found that different learning strategies impact students' technology use and learning outcomes in online environments.
<i>Kearney et al.</i>	2021	Collaborative learning, peer interaction	Qualitative analysis	Highlighted the importance of peer interaction in enhancing collaborative learning experiences in both modalities.
<i>Lim & Chai</i>	2021	Digital literacy, learning outcomes	SEM	Identified that digital literacy positively influences learning outcomes in online education.
<i>Wang & Newlin</i>	2021	Motivation, learning satisfaction	Structural Equation Modeling (SEM)	Shown that intrinsic motivation significantly predicts learning satisfaction in online environments.
<i>Guri-Rosenblit</i>	2021	Perceptions of online vs. offline education	Survey analysis	Found that students often prefer offline education for its social aspects, despite acknowledging the benefits of online learning.
<i>Kauffman & Frangenheim</i>	2021	Student engagement, course completion	Logistic regression	Found that higher student engagement in online courses correlates with increased course completion rates.
<i>Kuo & Belland</i>	2021	Interaction quality, learning outcomes	Structural Equation Modeling (SEM)	Found that interaction quality significantly predicts learning outcomes in online education.
<i>Lee & Lehto</i>	2021	Student engagement, online learning effectiveness	Descriptive statistics	Identified that engaging online learning activities enhance overall effectiveness and student satisfaction.

<i>Shea et al.</i>	2022	Social presence, perceived learning	Correlation analysis	Established a positive relationship between social presence and students' perceived learning in online courses.
<i>Chen & Jones</i>	2022	Student perceptions, technology integration	Survey analysis	Found that successful technology integration positively influences students' perceptions of online learning.
<i>Chiu & Wang</i>	2022	Learning motivation, online learning satisfaction	SEM	Found that learning motivation mediates the relationship between online learning experiences and satisfaction.
<i>Sun et al.</i>	2023	Learning engagement, academic performance	Multiple regression analysis	Showed that increased engagement in online learning correlates with improved academic performance.
<i>Wu</i>	2024	Technological acceptance, learning effectiveness	Path analysis	Confirmed that technological acceptance significantly affects learning effectiveness in online education.

Source: Authors Compilation, 2025

3. Rationale of the study

When such attitudes emerge and cement, it is vital to aim for the reliability of teachers and pupils towards various forms of learning and teaching, particularly among Generation Z. An assessment of existing measures by the current authors and previous literature reveals various limitations associated with attitudinal scales. The fundamental challenge is the lack of a rigorous, psychometrically validated quantitative measure that demonstrates scale reliability and validity and, more importantly, allows for a comprehensive examination of attitudes towards the entire range of teachers and students in both online and offline contexts. This investigation is necessary because attitudinal and behavioural change would provide a scientific examination of learning and teaching methods to comprehend a sound academic environment.

4. Methods and Materials

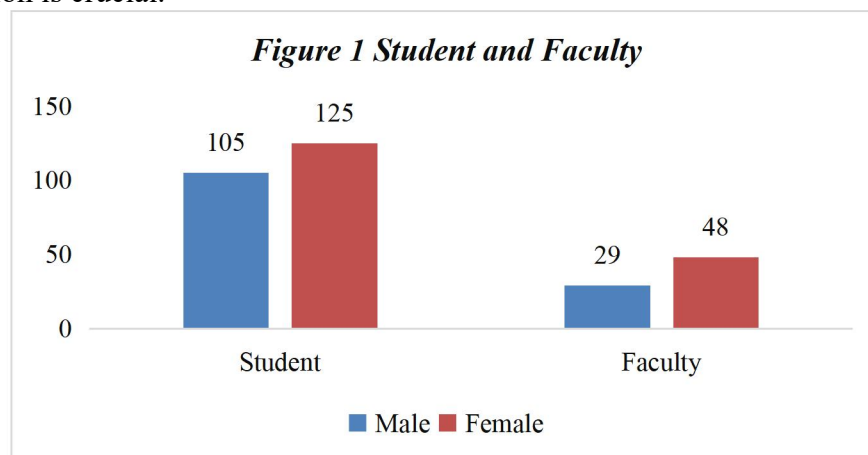
A parametric investigation evaluated the advantages and disadvantages of diverse learning approaches, including offline and online education, for students and faculty across various institutions and universities in Uttar Pradesh. Most researchers have considered online and offline education and have used quantitative methods to assess faculty interaction frequencies with students. The authors developed the questionnaire employed for the survey. Questions 1-30 evaluate the familiarity and preferences of students and faculty regarding diverse learning methodologies. Questions 1–10 relate to several inquiries concerning demographic parameters and the understanding of students and instructors with the employed mode of learning. Questions 11–15 seek to determine the factors influencing the comfort level of students and faculty with their way of learning. Questions 16-20 pertain to the suitability of offline learning for students

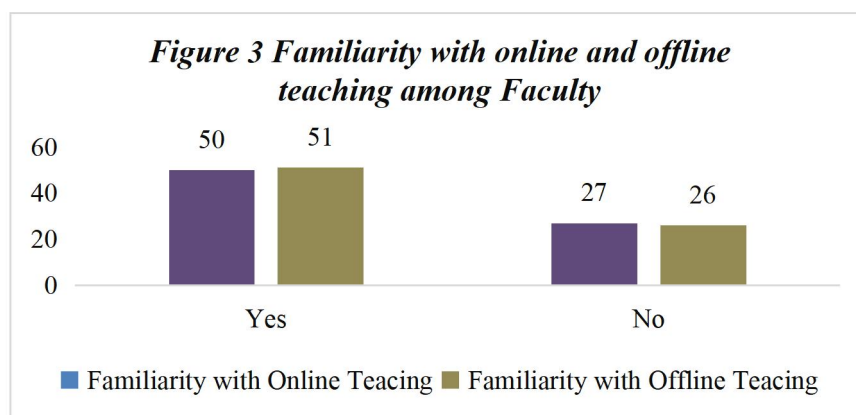
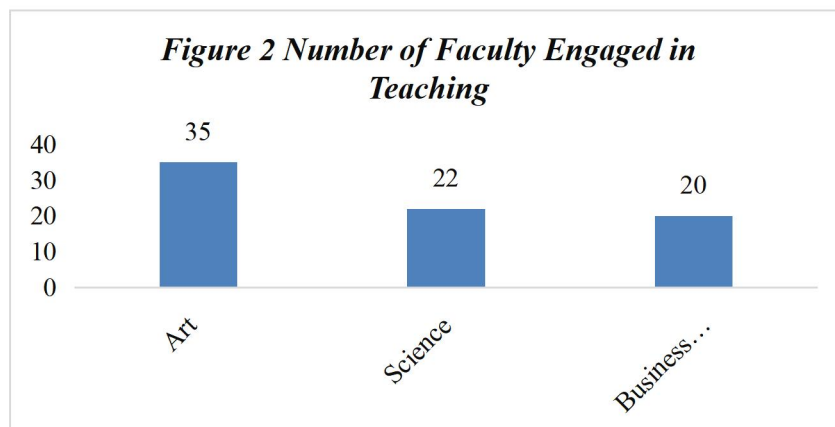
and faculty, designated as suitability in the learning modality. Questions 21 to 25 pertain to the suitability of online learning in the questionnaire. Questions 26 to 36 pertain to the experience of learning through offline and online modalities. Student responses are documented on a scale of 1 to 5, ranging from Strongly Disagree to Agree Strongly. The concluding section of the questionnaire requests feedback and recommendations from students and staff to improve existing teaching and learning practices. The questionnaire was disseminated using a Google Form, with a total of 307 participants comprising students and instructors from diverse colleges in Business Administration degrees. We utilized descriptive statistics, an independent t-test, and ANOVA to examine and analyze students' interest thoroughly. The regression is employed for assessing faculty and student effects using over factors, which is used for data analysis and hypothesis testing to evaluate the significance of each variable.

4.1 Demographic Description

Of the surveyed students, 125 are female and 105 are male, indicating a female majority of around 54%. Among faculty members, there are 48 females and 29 males, suggesting a notable female predominance in Figure 1. The gender distribution reveals that women participate in both higher education and academia. Policies aimed at advancing gender equity in educational environments should leverage this advantageous representation. The most substantial faculty cohort is in Art (35), followed by Science (22) and Business Administration (20) in Figure 2. The prominence of professors in the Art disciplines may indicate a heightened dependence on traditional or face-to-face teaching methods. There may be a need to promote digital instructional tools more assertively in this domain. The decreased enrollment in Business Administration may suggest a need for faculty recruitment or resource enhancement in that department.

Faculty Acquaintance with Online and Traditional teaching. Fifty faculty members reported familiarity with online instruction, whereas twenty-seven did not. Fifty-one faculty members reported acquaintance with offline instruction, whereas twenty-six did not in Figure 3. The majority of educators are adept in both teaching modalities, which is encouraging for the adoption of blended learning approaches. However, a substantial portion (about one-third) remains unacquainted, especially with online formats. The digital divide highlights the imperative for capacity-building activities, especially in the post-COVID-19 context where online education is crucial.





5. Results and Discussion

5.1 Level of Education and Mode of Learning among Students

It reflects a difference in the suitability of offline learning among groups classified by educational level. Given that the significance value ($p = 0.001$) is below 0.05, we reject the null hypothesis. This indicates that the educational level of students substantially affects their assessment of the suitability of offline learning. Students in the blended learning condition may have gained advantages from engaging with both instructional modalities or from the supplementary resources offered; however, both course variants were structured to be completed within a comparable timeframe by the students in alignment with the module criteria. Ultimately, there exists the potential for researcher bias to affect the results, as all educational groups were instructed by the same faculty, who also served as the principal investigator (Al-Qahtani & Higgins, 2013). Educational background significantly influences students' desire for offline learning more than for online learning. This may indicate an affection for traditional educational approaches among more educated individuals, but perceptions of online learning appear consistent across various educational levels, perhaps attributable to its extensive acceptance and adaptability.

Table 2: Level of Education and Psychological Variables

		<i>Sum of Squares</i>	<i>df</i>	<i>Mean Square</i>	<i>F</i>	<i>Sig.</i>	<i>Decision</i>
<i>Learning Experience</i>	Between Groups	1.787	2	.893	.884	.415	<i>Not Supported</i>
	Within Groups	229.373	227	1.010			
	Total	231.160	229				
<i>Comfortability in Learning</i>	Between Groups	.377	2	.189	.375	.688	<i>Not Supported</i>
	Within Groups	114.257	227	.503			
	Total	114.634	229				
<i>Offline Suitability in Learning</i>	Between Groups	14.618	2	7.309	7.739	.001	<i>Supported</i>
	Within Groups	214.382	227	.944			
	Total	229.000	229				
<i>Online Suitability in Learning</i>	Between Groups	1.748	2	.874	.873	.419	<i>Not Supported</i>
	Within Groups	227.252	227	1.001			
	Total	229.000	229				

Source: Field Survey, 2025, $p < 0.05$

5.2 Gender and Psychological Variables

The examination of differences between genders in educational variables uncovers significant patterns in learners' perspectives. Female students indicated a more favourable learning experience (Mean = 0.134) than their male counterparts (Mean = -0.162), signifying greater pleasure and involvement in educational environments. This finding corresponds with the research conducted by Binyamin et al. (2019) and Alghamdi et al. (2020), indicating that female students frequently exhibit enhanced adaptability and motivation, hence enriching their learning experiences. Regarding learning comfort, both male (Mean = 0.025) and female (Mean = -0.021) learners exhibited comparable levels of comfort, suggesting that gender may not substantially affect students' comfort during learning, reinforcing Sánchez-Franco's (2009) claim that emotional and environmental factors are more influential. In terms of offline suitability, female learners (Mean = 0.124) had more positive perceptions than their male counterparts (Mean = -0.148), maybe attributable to a propensity for organised and participatory settings, as noted by Kemp & Grieve (2014). Females assessed the suitability of online learning higher (Mean = 0.159) than males (Mean = -0.189), indicating superior digital adaptability among women, in accordance with the findings of Pei & Wu (2019) and Cai et al. (2024). The findings suggest that female learners have a more favourable perception of both online and offline learning, whereas comfort in learning is largely uniform across genders.

Table 3: Descriptive Statistics of Psychological Variables

<i>Gender</i>		<i>N</i>	<i>Mean</i>	<i>Std. Deviation</i>	<i>Std. Error Mean</i>	<i>Interpretation</i>
<i>Learning Experience</i>	<i>Male</i>	105	-.16	.94	.09	Females report a more positive overall learning experience
	<i>Female</i>	125	.13	1.04	.09	
<i>Comfortability in Learning</i>	<i>Male</i>	105	.03	.72	.07	Very small difference; both genders report similar levels of comfort in learning
	<i>Female</i>	125	-.02	.70	.06	
<i>Offline Suitability in Learning</i>	<i>Male</i>	105	-.15	.95	.09	Females view offline learning as more suitable than males
	<i>Female</i>	125	.12	1.03	.09	
<i>Online Suitability in Learning</i>	<i>Male</i>	105	-.19	.89	.09	Females also report higher suitability for online learning than males
	<i>Female</i>	125	.16	1.06	.10	

Source: Field Survey, 2025

The p-values for Learning Experience ($F = 1.24, p = 0.27$) and Offline Suitability in Learning ($F = 0.32, p = 0.57$) surpass 0.05, indicating that equal variances may be assumed. Therefore, the outcomes of the standard t-test are valid. The differences in Comfortability in Learning ($F = 0.00, p = 0.95$) are consistent across genders. Levene's Test for Online Suitability in Learning indicates significant variance inequality ($F = 5.49, p = 0.02$), implying that equal variances cannot be presumed. Thus, the Welch's t-test, modified for varying variances, is utilized for accurate comparison. Levene's Test confirms the validity of the homogeneity of variances assumption, facilitating the reliable interpretation of t-test results (Field, 2013). The evidence indicates that the variance in views of online suitability among educational levels is not of statistical significance ($F = 0.873, p = 0.419 > 0.05$), implying that students, irrespective of their level of education, overwhelmingly hold comparable opinions regarding online learning platforms. The independent samples t-test reveals a statistically significant difference between male and female students ($t = -2.71, p = 0.01 < 0.05$), indicating that females exhibit a greater suitability for online learning (Mean difference = -0.35). This supports the findings of Pei and Wu (2019), who determined that female students frequently exhibit superior adaptability to online contexts, presumably owing to enhanced self-regulation and digital engagement competencies. The results indicate a significant difference based on education level ($F = 7.739, p = 0.001 < 0.05$), suggesting that students at varying education levels possess distinct suitability or experiences for offline learning environments. The t-test indicates a significant gender disparity ($t = -2.08, p = 0.04$), with females consistently demonstrating greater offline adaptability (Mean difference = -0.27). This corresponds with the findings of Kemp and Grieve (2014), who discovered that female students frequently prefer in-person interactions and organized environments, characteristic of traditional learning. The results presented indicate that although education level significantly influences desires for offline learning, gender has a greater

influence on the suitability of both online and offline learning. Female students exhibit a larger inclination towards both modalities, possibly attributable to more proactive learning practices and enhanced adaptability (Cai et al., 2024).

Table 4: Independent Samples Test between Gender and Psychological Variables

		Levene's Test for Equality of Variances		t-test for Equality of Means				
		<i>F</i>	<i>Sig.</i>	<i>t</i>	<i>df</i>	<i>Sig. (2-tailed)</i>	<i>Mean Difference</i>	<i>Std. Error Difference</i>
Learning Experience	Equal variances assumed	1.24	0.27	-2.25	228.00	0.03	-0.30	0.13
	Equal variances not assumed			-2.27	226.73	0.02	-0.30	0.13
Comfortability in Learning	Equal variances assumed	0.00	0.95	0.50	228.00	0.62	0.05	0.09
	Equal variances not assumed			0.49	219.42	0.62	0.05	0.09
Offline Suitability in Learning	Equal variances assumed	0.32	0.57	-2.08	228.00	0.04	-0.27	0.13
	Equal variances not assumed			-2.10	226.17	0.04	-0.27	0.13
Online Suitability in Learning	Equal variances assumed	5.49	0.02	-2.67	228.00	0.01	-0.35	0.13

Equal variances not assumed	-2.71	227.9 9	0.01	-0.35	0.13
--------------------------------------	-------	------------	------	-------	------

5.2 Teaching Experience and Mode of Learning

There is no statistically significant difference in reported learning experiences between different levels of teaching expertise, according to the ANOVA results ($F = 0.884$, $p = 0.415$). This suggests that teachers' opinions of the entire educational process are mostly unchanged, regardless of how long they have been teaching. This study confirms earlier studies suggesting that factors like institutional support and technology readiness may be more significant than experience alone (Rapanta et al., 2020). Learning Comfort ($F = 0.375$, $p = 0.688$): Similarly, the ease in learning does not markedly vary with teaching experience. Novice and seasoned faculty seem to have similar levels of comfort inside the learning environment. This corresponds with Gonzalez et al. (2020), who found that both rookie and seasoned faculty can adapt to changing learning environments when provided with suitable training and tools. Offline Suitability in Learning ($F = 7.739$, $p < 0.001$): This conclusion is statistically significant, indicating that perceptions of the suitability of offline learning vary significantly according to teaching experience. Experienced faculty may be more accustomed to traditional classroom environments and hence view offline learning more favourably. In contrast, less experienced faculty may demonstrate increased adaptability or a predilection for hybrid or online instructional techniques. Studies reveal that experienced faculty often demonstrate a strong inclination for face-to-face interaction, due to their familiarity and established teaching methodologies (Trust & Whalen, 2020). The examination of Online Suitability in Learning ($F = 0.873$, $p = 0.419$) reveals no significant difference in opinions about online learning suitability across different experience levels. This indicates a growing embrace of digital platforms in education, since even experienced faculty are becoming more proficient with online technology, presumably due to the enforced transition during the COVID-19 pandemic (Dhawan, 2020).

Table 5: Teaching Experience and Mode of Learning

		<i>Sum of Squares</i>	<i>df</i>	<i>Mean Square</i>	<i>F</i>	<i>Sig.</i>
Learning Experience	Between Groups	1.787	2	.893	.884	.415
	Within Groups	229.373	227	1.010		
	Total	231.160	229			
Comfortability in Learning	Between Groups	.377	2	.189	.375	.688
	Within Groups	114.257	227	.503		
	Total	114.634	229			
Offline Suitability in	Between	14.618	2	7.309	7.739	.001

Learning	Groups				
	Within Groups	214.382	227	.944	
	Total	229.000	229		
	Between Groups	1.748	2	.874	.873
Online Suitability in Learning	Within Groups	227.252	227	1.001	.419
	Total	229.000	229		

5.3 Students' Psychology towards the Mode of Learning

Offline Learning Suitability

Age exerts a negative and significant influence ($\beta = -0.054, p < 0.05$), indicating that younger students regard offline learning as more appropriate than their older counterparts. Familiarity with online classes is inversely correlated ($\beta = -0.265, p < 0.05$), suggesting that students with greater familiarity with online environments regard offline modalities as less suitable. The level of graduation is strongly correlated with the acceptability of offline learning ($\beta = 0.220, p < 0.05$), indicating that undergraduate students favour offline environments more than postgraduate students. Younger students may like the organized settings provided by in-person learning, which facilitate social contact and immediate feedback (Kemp & Grieve, 2014). Simultaneously, heightened engagement with online platforms may diminish the decision for offline options (Pei & Wu, 2019).

Online Suitability in Learning

Age exerts a positive and substantial influence ($\beta = 0.020, p < 0.01$), suggesting that older students generally see online learning as more suitable. Acquaintance with Offline Classes exhibits a significant negative impact ($\beta = -0.213, p < 0.01$), indicating that individuals habituated to traditional methods have difficulties using online platforms. The Learning Experience significantly influences perceptions of online learning suitability ($\beta = 0.187, p < 0.01$), suggesting that students with superior overall experiences are more inclined to see online learning favourably. Older students may like the flexibility and self-directed aspect of online learning (Bawa, 2016), but individuals accustomed to traditional classroom environments may struggle to adjust (Rapanta et al., 2020).

Comfortability in Learning

Age has a positive correlation ($\beta = 0.035, p < 0.01$), indicating a marginal increase in comfort with advancing age. Acquaintance with Offline Class exhibits a significant negative correlation ($\beta = -0.627, p < 0.01$), suggesting that students well-versed in conventional instruction may experience diminished comfort in adaptable or novel modalities. Online suitability in learning significantly predicts comfort ($\beta = 0.683, p < 0.01$), indicating that students who perceive online learning as appropriate are more likely to feel at ease. The comfort levels of students are frequently associated with their prior experiences and preferences for learning modalities. Digital fluency and perceived control favourably affect online comfort (Ngampornchai & Adams, 2016).

Learning Experience

The learning experience is influenced by age, which has a minor yet notable negative impact ($\beta = -0.019$, $p < 0.05$), indicating that older students may have somewhat less favourable learning experiences. Acquaintance with Offline Class positively affects the learning experience ($\beta = 0.184$, $p < 0.01$). Online Suitability in Learning and Comfortability in Learning are both significant positive predictors ($\beta = 0.503$ and $\beta = 0.392$, respectively, $p < 0.01$), indicating that students who perceive online learning as suitable and feel at ease are likely to report enhanced overall learning experiences. The learning experience of students is profoundly influenced by the comfort and appropriateness of the educational environment (Alqahtani & Rajkhan, 2020). Favourable digital learning environments enhance happiness and academic engagement (Binyamin et al., 2019).

The regression analysis indicates that familiarity, age, and prior experiences substantially affect students' preferences for and comfort in various learning contexts. Younger pupils favour traditional learning methods, whereas older and technologically proficient students exhibit greater adaptation to online platforms. Acquaintance with particular formats substantially influences comfort and overall learning satisfaction, highlighting the significance of orientation and blended exposure in contemporary education.

Table 6: Students' Psychology towards the Mode of Learning

	<i>Offline Suitability in Learning</i>	<i>Online Suitability in Learning</i>	<i>Comfortability in Learning</i>	<i>Learning Experience</i>
<i>Age (Years)</i>	-0.054** (0.026)	0.020** (0.009)	0.035* (0.021)	-0.019** (0.009)
<i>Gender (Male=1, Female=0)</i>	0.115 (0.109)	0.036 (0.038)	-0.038 (0.090)	0.023 (0.040)
Course Stream				
<i>MBA</i>	-0.088 (0.129)	-0.001 (0.045)	-0.051 (0.106)	0.026 (0.047)
<i>PGDM</i>	-0.117 (0.130)	0.024 (0.045)	-0.013 (0.106)	0.006 (0.047)
Level of Education				
<i>Graduation</i>	0.220* (0.128)	0.019 (0.045)	0.134 (0.105)	-0.019 (0.047)
<i>Post-Graduation</i>	0.480*** (0.132)	-0.021 (0.048)	0.011 (0.111)	0.005 (0.049)
<i>Familiarity in Online Class (Yea=1, No=0)</i>	-0.265** (0.122)	0.075* (0.043)	-0.069 (0.101)	-0.060 (0.044)
<i>Familiarity in Offline Class (Yea=1, No=0)</i>	0.021	-0.213***	-0.627***	0.184***

	(0.143)	(0.048)	(0.109)	(0.050)
<i>Learning Experience</i>	0.027 (0.187)	0.908*** (0.022)	0.010 (0.153)	
<i>Online Suitability in Learning</i>	0.503*** (0.190)		-0.083 (0.158)	0.972*** (0.024)
<i>Comfortability in Learning</i>	-0.111 (0.083)	-0.015 (0.029)		0.002 (0.030)
<i>Offline Suitability in Learning</i>		0.062*** (0.023)	-0.074 (0.055)	0.004 (0.025)
<i>Constant</i>	1.048* (0.578)	-0.443** (0.202)	-0.592 (0.474)	0.378* (0.213)
<i>Observations</i>	230	230	230	230
<i>R-squared</i>	0.392	0.925	0.19	0.921

Standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

5.4 Faculty Psychology towards the Mode of Learning

Age adversely and significantly impacts teaching experience ($\beta = -0.400$, $p < 0.05$), suggesting that older faculty members perceive a less satisfactory teaching experience, potentially due to diminished adaptability to contemporary technologies or pedagogical approaches. The suitability of online learning exhibits a substantial negative correlation ($\beta = -0.361$, $p < 0.05$), indicating that instructors who prefer online instruction may perceive their teaching experiences as ineffective, potentially attributable to challenges in interaction, engagement, or digital weariness. Senior faculty members frequently encounter difficulties in adjusting to swift technology advancements, thus impeding their instructional efficacy (Cutri et al., 2020; Johnson et al., 2012). Offline Suitability in Learning Teaching experience exhibits a strongly negative correlation ($\beta = -0.028$, $p < 0.05$), indicating that more seasoned faculty are less favourable towards offline suitability, potentially due to recent adaptations to or preferences for online modalities. Online Suitability in Learning ($\beta = -0.166$) exhibits a negative correlation, indicating that individuals who prefer online modalities perceive offline options as less attractive. Rapanta et al. (2020) assert that numerous faculty members, especially those who adjusted during COVID-19, now perceive online education as more flexible and successful than conventional approaches. The comfort level in teaching has a substantial and significant positive influence ($\beta = 0.424$, $p < 0.01$), indicating that faculty members who experience greater comfort in their teaching jobs are more likely to perceive online learning as appropriate. The suitability of offline learning is negatively correlated ($\beta = -0.336$, $p < 0.05$), suggesting a trade-off: teachers who deem offline modes appropriate are less inclined to endorse online approaches. Bolliger & Wasilik (2009) assert that faculty satisfaction with online teaching is affected by their comfort and confidence levels. The documented inverse link between online and offline preferences is established (Baran

et al., 2011). Comfort in Teaching Gradation level ($\beta = -0.253, p < 0.05$) exerts a negative and significant influence, indicating that faculty with merely a graduate degree may have diminished comfort in teaching responsibilities relative to those with postgraduate qualifications.

Acquaintance with Offline Class adversely impacts comfort ($\beta = -0.309, p < 0.05$), potentially indicating a transition burden; individuals accustomed to traditional classrooms may be grappling with changing pedagogical approaches. The suitability of online learning positively affects teaching comfort ($\beta = 0.103, p < 0.05$), indicating that proponents of online education experience greater confidence in their instructional methods. Proficiency and familiarity with digital tools markedly bolster faculty teaching confidence (Baran et al., 2011; Huang et al., 2020). In contrast, traditional-mode faculty frequently oppose instructional transformation, affecting their general comfort (Trust & Whalen, 2020).

Table 7: Faculty Psychology towards the Mode of Learning

	Teaching Experience	Offline Suitability in Teaching	Online Suitability in Teaching	Comfortability in Teaching
Age (Years)	-0.400* (0.224)	-0.200 (0.169)	-0.117 (0.242)	0.002 (0.119)
Gender (Male=1, Female=0)	-0.016	-0.028*	-0.013	-0.012
Level of Education				
	(0.022)	(0.016)	(0.023)	(0.011)
Graduation	0.041 (0.263)	-0.092 (0.196)	0.062 (0.277)	-0.253* (0.133)
Post-Graduation	0.343 (0.267)	-0.148 (0.200)	0.045 (0.284)	-0.171 (0.138)
Teaching Experience (Years)	0.023 (0.022)	-0.028* (0.016)	0.007 (0.023)	0.006 (0.011)
Level of Education				
MBA	0.088 (0.271)	0.161 (0.201)	-0.221 (0.284)	-0.254* (0.137)
PGDM	0.401 (0.268)	-0.047 (0.203)	-0.011 (0.287)	-0.209 (0.139)
Familiarity in Online Class (Yea=1, No=0)	0.328 (0.242)	-0.100 (0.183)	0.002 (0.259)	0.101 (0.127)
Familiarity in Offline Class (Yea=1, No=0)	-0.224 (0.260)	0.210 (0.193)	0.030 (0.276)	-0.309** (0.130)
Comfortability in Teaching	0.099 (0.241)	-0.117 (0.179)	0.424* (0.248)	

<i>Online Suitability in Teaching</i>	-0.361*** (0.110)	-0.168* (0.086)		0.103* (0.060)
<i>Offline Suitability in Teaching</i>	-0.065 (0.168)		-0.336* (0.172)	-0.056 (0.087)
<i>Teaching Experience</i>		-0.036 (0.093)	-0.400*** (0.122)	0.026 (0.065)
<i>Constant</i>	0.630 (0.925)	1.405** (0.669)	0.535 (0.975)	0.755 (0.471)
<i>Observations</i>	77	77	77	77
<i>R-squared</i>	0.281	0.218	0.278	0.257

*Standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$*

6. Conclusion

In conclusion, the online and offline learning approach utilized in this study appears to have provided a significant benefit to student achievement. The particular integration of offline education with an educator and the adaptability of online learning in this environment, customized for these students, may have offered distinct mediational potential. The absence of a course may pose a disadvantage in specific e-learning contexts, particularly for students familiar with conventional teaching methods, as suggested by the cultural context of this study. Age adversely affects offline applicability in education and the learning experience, indicating that younger pupils exhibit greater adaptability to both offline and online modalities. Acquaintance with online platforms markedly enhances the appropriateness of online learning, concurrently diminishing the inclination towards offline modalities, suggesting that digital exposure influences student choices. Acquaintance with offline classes correlates positively with the learning experience and comfort, although it adversely affects online adaptability, indicating a reluctance to transition among students accustomed to traditional instruction. Postgraduate students exhibit greater offline appropriateness, presumably attributable to their maturity and inclination for controlled learning. There exists a robust interaction across factors; for instance, online suitability considerably forecasts the learning experience, indicating that technological adaptation improves perceived learning quality. Age and teaching experience adversely impact the learning experience and offline appropriateness, perhaps due to inflexibility or difficulties un adjusting to contemporary pedagogical instruments. Acquaintance with offline modalities enhances comfort and teaching experience, whereas familiarity with online classrooms demonstrates a weaker or negligible correlation. The integration of online resources by teachers is positively correlated with enhanced learning experiences, suggesting improved engagement and outcomes. The faculty's educational attainment (MBA/PGDM) does not substantially forecast adaptability, indicating a necessity for training beyond formal schooling. The participants were appropriately aligned in terms of technological ability, experience, and foundational comprehension of the course material.

7. Policy Implications

Institutions should devote resources to mandatory digital orientation workshops to enhance students' competence and confidence in online learning platforms, thereby improving their educational experience. A mixed paradigm should be implemented to accommodate diverse student preferences due to the varying suitability of online and offline formats. Counselling and peer mentoring should be instituted to support students facing challenges with either learning modality, particularly those transitioning from traditional to online environments. Curriculum design must be flexible and modular to cater to both digital-native and traditional learners, thus fostering inclusive education. Regular training seminars on digital pedagogy and learning management systems (LMS) should be established to improve faculty adaptability to online formats. Senior academics demonstrating restricted adaptability may benefit from peer assistance or reverse mentorship from digitally proficient peers. Teaching evaluations should incorporate integrated teaching effectiveness, prioritizing comfort and suitability across all modalities, rather than focusing exclusively on academic qualifications or competence. Faculty who effectively integrate online resources into their classrooms may be awarded incentives, research funds, or promotions to encourage broader adoption. Since age negatively correlates with adaptability, training must be customized based on age and technical proficiency to maximize effectiveness.

Reference

1. Alghamdi, A. K. H., Alyoubi, K. H., & Asiri, M. J. (2020). Students' perceptions of the effectiveness of online learning during the COVID-19 pandemic: A case study. *International Journal of Emerging Technologies in Learning (iJET)*, 15(20), 30–44. <https://doi.org/10.3991/ijet.v15i20.16115>
2. Allen, I. E., & Seaman, J. (2003). Sizing the opportunity: The quality and extent of online education in the United States, 2002 and 2003. *Sloan Consortium (NJ)*.
3. Allen, I. E., & Seaman, J. (2003). Sizing the opportunity: The quality and extent of online education in the United States, 2002 and 2003. *Sloan Consortium (NJ)*.
4. Baran, E., Correia, A.-P., & Thompson, A. (2011). Online teacher roles and competencies: A literature review. *Distance Education*, 32(3), 421–439. <https://doi.org/10.1080/01587919.2011.610293>
5. Binyamin, S. S., Rutter, M. J., & Smith, S. (2019). The impact of learning management systems on student performance and satisfaction. *Education and Information Technologies*, 24(3), 1731–1749. <https://doi.org/10.1007/s10639-019-09994-8>
6. Bolliger, D. U., & Wasilik, O. (2009). Factors influencing faculty satisfaction with online teaching. *Distance Education*, 30(1), 103–116. <https://doi.org/10.1080/01587910902845949>
7. Cutri, R. M., Mena, J., & Whiting, E. F. (2020). Faculty readiness for online crisis teaching: Transitioning to online teaching during the COVID-19 pandemic. *European Journal of Teacher Education*, 43(4), 523–541. <https://doi.org/10.1080/02619768.2020.1815702>
8. Dhawan, S. (2020). Online learning: A panacea in the time of COVID-19 crisis. *Journal of Educational Technology Systems*, 49(1), 5–22. <https://doi.org/10.1177/0047239520934018>
9. Gonzalez, T., De La Rubia, M. A., Hincz, K. P., Comas-Lopez, M., Subirats, L., Fort, S., & Sacha, G. M. (2020). Influence of COVID-19 confinement on students' performance in higher education. *Computers in Human Behavior*, 107, 106424. <https://doi.org/10.1016/j.chb.2020.106424>

10. Hargreaves, A., & Goodson, I. (2006). Educational change over time? The sustainability and nonsustainability of three decades of secondary school change and continuity. *Educational administration quarterly*, 42(1), 3-41.
11. Huang, R. H., et al. (2020). Disrupted classes, undisrupted learning: Tips for educators. Smart Learning Institute, Beijing Normal University.
12. J.Y.F. Chang, L.H. Wang, T.C. Lin, F.C. Cheng, C.P. Chiang, Comparison of learning effectiveness between physical classroom and online learning for dental education during the COVID-19 pandemic. *J. Dent. Sci.* 16(4), 1281–1289 (2021)
13. J.Y.F. Chang, L.H. Wang, T.C. Lin, F.C. Cheng, C.P. Chiang, Comparison of learning effectiveness between physical classroom and online learning for dental education during the COVID-19 pandemic. *J. Dent. Sci.* 16(4), 1281–1289 (2021)
14. Johnson, T. E., Wisniewski, M. A., et al. (2012). Overcoming anxiety through faculty bootcamp. *Journal of Asynchronous Learning Networks*, 16(2), 63–72. <https://doi.org/10.24059/olj.v16i2.264>
15. Kemp, N., & Grieve, R. (2014). Face-to-face or face-to-screen? Undergraduates' opinions and test performance in classroom vs. online learning. *Computers & Education*, 74, 110–121. <https://doi.org/10.1016/j.compedu.2014.01.009>
16. Lee, S. W. Y., Tu, H. Y., Chen, G. L., & Lin, H. M. (2023). Exploring the multifaceted roles of mathematics learning in predicting students' computational thinking competency. *International journal of STEM education*, 10(1), 64.
17. Muilenburg, L. Y., & Berge, Z. L. (2005). Student barriers to online learning: A factor analytic study. *Distance education*, 26(1), 29-48.
18. Pei, L., & Wu, H. (2019). Does online learning work better than offline learning in undergraduate medical education? A systematic review and meta-analysis. *Medical education online*, 24(1), 1666538.
19. Pei, L., & Wu, H. (2019). Does online learning work better than offline learning in undergraduate medical education? A systematic review and meta-analysis. *Education and Information Technologies*, 24, 2665–2686. <https://doi.org/10.1007/s10639-019-09927-5>
20. Pei, L., & Wu, H. (2019). Does online learning work better than offline learning in undergraduate medical education? A systematic review and meta-analysis. *Medical education online*, 24(1), 1666538.
21. Rapanta, C., Botturi, L., Goodyear, P., Guàrdia, L., & Koole, M. (2020). Online university teaching during and after the Covid-19 crisis: Refocusing teacher presence and learning activity. *Postdigital Science and Education*, 2(3), 923–945. <https://doi.org/10.1007/s42438-020-00155-y>
22. Rapanta, C., et al. (2020). Online university teaching during and after COVID-19. *Postdigital Science and Education*, 2(3), 923–945. <https://doi.org/10.1007/s42438-020-00155-y>
23. Riaz, F., Mahmood, S. E., Begum, T., Ahmad, M. T., Al-Shaikh, A. A., Ahmad, A., ... & Khan, M. S. (2023). Students' preferences and perceptions regarding online versus offline teaching and learning post-COVID-19 lockdown. *Sustainability*, 15(3), 2362.
24. Rovai, A. P. (2002). Building sense of community at a distance. *International Review of Research in Open and Distributed Learning*, 3(1), 1-16.

25. Sánchez-Franco, M. J. (2009). The moderating effects of involvement on the relationships between satisfaction, trust and commitment in e-banking. *Computers & Education*, 52(2), 464–473. <https://doi.org/10.1016/j.compedu.2008.10.001>
26. Shea, P., Richardson, J., & Swan, K. (2022). Building bridges to advance the community of inquiry framework for online learning. *Educational Psychologist*, 57(3), 148-161.
27. Trust, T., & Whalen, J. (2020). Should teachers be trained in emergency remote teaching? Lessons learned from the COVID-19 pandemic. *Journal of Technology and Teacher Education*, 28(2), 189–199.
28. Trust, T., & Whalen, J. (2020). Teacher preparedness for remote learning. *Journal of Technology and Teacher Education*, 28(2), 189–199.
29. Veeraiyan, D. N., Varghese, S. S., Rajasekar, A., Karobari, M. I., Thangavelu, L., Marya, A., ... & Scardina, G. A. (2022). Comparison of interactive teaching in online and offline platforms among dental undergraduates. *International journal of environmental research and public health*, 19(6), 3170.
30. Veeraiyan, D. N., Varghese, S. S., Rajasekar, A., Karobari, M. I., Thangavelu, L., Marya, A., ... & Scardina, G. A. (2022). Comparison of interactive teaching in online and offline platforms among dental undergraduates. *International journal of environmental research and public health*, 19(6), 3170.
31. Veeraiyan, D. N., Varghese, S. S., Rajasekar, A., Karobari, M. I., Thangavelu, L., Marya, A., ... & Scardina, G. A. (2022). Comparison of interactive teaching in online and offline platforms among dental undergraduates. *International journal of environmental research and public health*, 19(6), 3170.
32. Venkatesh, V., & Bala, H. (2008). Technology acceptance model 3 and a research agenda on interventions. *Decision sciences*, 39(2), 273-315.
33. Venkatesh, V., & Davis, F. D. (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies. *Management science*, 46(2), 186-204.
34. Wu, D. (2024). Improving Hydrologic Connectivity Delineation Based on High-Resolution DEMS and Geospatial Artificial Intelligence (Doctoral dissertation, Southern Illinois University at Carbondale).
35. Wu, R., Zhao, J., Cheung, C., Natsuaki, M. N., Rebok, G. W., & Strickland-Hughes, C. M. (2021). Learning as an important privilege: A life span perspective with implications for successful aging. *Human Development*, 65(1), 51-64.