

## **DETERMINING UNIVERSITY STUDENTS' ATTITUDE TOWARDS E-LEARNING**

**Harpreet Singh**

*Teacher, Government Senior Secondary Smart School, Bhillowal Pacca,  
Amritsar, Punjab-143001, India.*

*Email:- [hsingh6371@gmail.com](mailto:hsingh6371@gmail.com)*

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### ***Abstract***

*With the rapid advancement of the internet and the widespread integration of ICT tools, the teaching-learning landscape has undergone a profound transformation. Complex concepts and processes are now accessible at the tap of a smartphone, cementing e-learning as a cornerstone of modern education. This study delves into university students' attitudes toward e-learning while also investigating potential gender differences in perceptions of this dynamic learning approach. An online survey conducted among 105 university students yielded 100 valid responses for analysis. Through factor analysis and the Mann-Whitney U test, three critical factors influencing attitude of students regarding e-learning emerged: usefulness, efficiency, and ease of use. Interestingly, Mann-Whitney U test results depicted insignificant gender-based differences in attitudes toward usefulness ( $p=0.742$ ), efficiency ( $p=0.939$ ), and ease of use ( $p=0.385$ ). These findings offer important insights into students' perspectives on e-learning, providing practical suggestions for policymakers and educators to elevate the development and implementation of e-learning platforms. With the alignment of changing needs of diverse learners, these platforms can be made more effective and inclusive.*

**Keywords:** *ICT tools, E-learning, attitude, gender differences, usefulness, efficiency and ease of use.*

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### **1. INTRODUCTION**

In the modern era, learning is no longer restricted to the boundaries of the classroom. It extends beyond these traditional boundaries and can occur in waiting rooms, railway stations, at bus stops, during visits to museums, educational field trips, and even in marketplaces. In essence, learning is possible 'anywhere' and 'anytime'. This shift toward an 'anywhere-anytime' learning model is facilitated by innovative technologies, including various technology-enabled learning devices (Halder et al., 2022). The rising need for easily accessible, versatile, and affordable learning platforms mandates an investigation of these platforms effectiveness across different contexts, along with their potential to cater various needs of learners.

E-learning, short for electronic learning is a training method delivered via the internet or network-based systems, involving instructional content provided through electronic media. While an e-learning's precise definition is still debated, broadly recognized as the delivery of diverse content

formats—such as videos, text, and images—through electronic platforms like the laptops, internet, CD-ROMs or personal digital assistants (PDAs) (Sanchez and Karaksha, 2022). Learning management systems play a crucial role in facilitating e-learning by centralizing courses, assessments, and student grades within a single platform.

E-learning is growing rapidly across the world (Arumugam et al., 2024). It is used by universities, businesses, communities and over one million users are now learning through this method. The rise in usage indicates the increasing dependency on e-learning as an integral educational platform, focusing on the importance of assessing the determinants impacting its usage and adoption and its overall effectiveness. E-learning typically includes applying information, networking and technological advances to facilitate teaching and learning processes. This approach heavily depends on IT technologies such as computer networks, multimedia technologies, and so on (Akcil & Bastas, 2020). Accordingly, e-learning incorporate advanced electronic information and communication media such as teleconferencing, video conferencing, email, live chat, internet browsing, online libraries, customized e-learning courses, and more. E-learning courses can be done live, where students can participate digitally just as they would in a physical classroom (Loupatty & Wayangkau, 2017). Alternatively, students can be guided through the material using pre-recorded modules. As the educational landscape develops, it becomes the requirement to understand both the opportunities and problems within e-learning in order to enhance its utilization. In addition, evaluating how these online tools could become more readily available across different learner demographic is vital to enhance their impact.

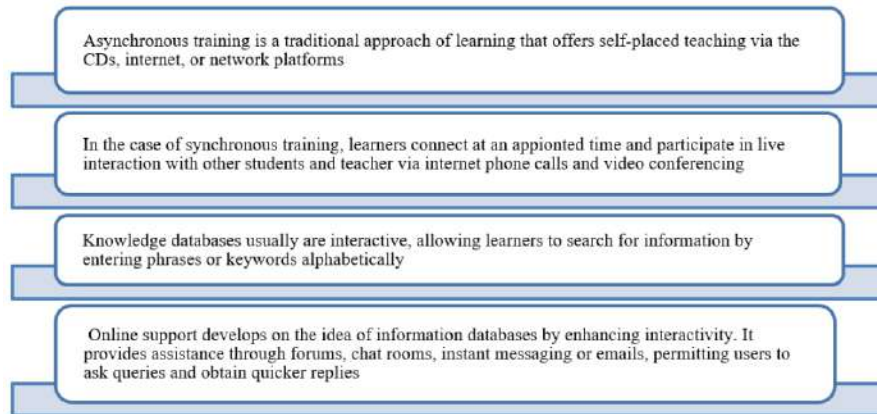
The successful implementation of e-learning depends on various critical elements as highlighted by Reynolds (2012):

1. **Experience:** The technological familiarity and competence of learners substantially impact their effective use and acceptance of e-learning platforms. Computer knowledge and basic technological skills are required for effectively utilizing these modern learning methods.
2. **Change in Behavior:** The e-learning adoption has the ability to change the learners' behavior, especially regarding the interpersonal aspect of learning. Virtual learning environments encourage students to become community member and to take part in collaborative learning experiences.
3. **Organizational Impact:** The accomplishment of e-learning is intrinsically linked to the support offered by the organization that implements it. Organizational structures that foster the technology adoption, like providing support and guidance for educators, can elevate engagement with online learning.

There are four kinds of e-learning, including synchronous training, asynchronous training, Knowledge databases, and online support (Fu et al., 2021) as exhibits in figure 1. These four types of e-

learning have been selected because they include every vital component of digital learning: self-paced learning, real time interaction, persistent learner assistance, and structured information repositories. This classification offers an integrated approach, addressing to an extensive range of learning requirements as well as integrating technology improvements in digital education, providing an adequate foundation that promotes effective knowledge distribution and student participation.

**Figure 1: Types of E-Learning**



*Source: Compiled by author*

E-learning provides numerous benefits, including versatility, adaptability, and cost-effectiveness, but it also has drawbacks including technological barriers, social isolation, and academic integrity concerns. It is imperative to overcome these challenges and optimize organizational strategies in order to enhance its capacity in encouraging skill development and lifelong learning (Akgun, 2022). E-learning presents an unprecedented change in education, providing opportunities for accessible and personalized learning experiences. It has the potential to modernize education and empower learners all over the world through the integration of modern technology and useful pedagogical methods.

## **2. REVIEW OF LITERATURE**

Akgun et al. (2024) researched the undergraduate student's attitude about online learning in the pandemic of COVID-19. The outcomes of the research showed that most participants were female (68.8%) and aged between 21 and 24 years (51.6%). Over half of the students (55.3%) reported an unfavorable attitude towards e-learning. Students aged 25 to 29, demonstrated significantly more positive attitudes than their younger counterparts, and students who owned a computer had more favorable views of online learning. Further, illustrating that majority of the students disagreed with an idea that online learning offered better learning opportunities than traditional classroom methods.

Halder et al. (2022) evaluated students' perspective about e-learning and its impact on academic performance. The research employed a descriptive survey approach and included 300 college students from the science and arts streams in Nadia district, who had been chosen using purposive sampling.

This study focused on locality, gender, educational stream, and academic achievement as independent constructs, while students' attitudes served as the dependent construct. The findings revealed a strong association between students' attitudes and their academic success.

Sanchez and Karaksha (2022) investigated the nursing student's attitude towards e-learning. The study included 71 sophomore nursing students, with 58 completing the survey, of which 82.8% were female. The results showed that prior computer instructions significantly enhanced confidence in utilizing the internet ( $t=2.1$ ,  $p<0.05$ ). Interestingly, nursing students with previous e-learning experience reported feeling significantly more anxious about using computers than those without such experience ( $t=2.3$ ,  $p<0.05$ ).

Akcil and Bastas (2020) analyzed university students' perceptions regarding e-learning and how its relationship with digital citizenship during the COVID-19 pandemic. The study used a correlational survey method, a qualitative research approach, and involved students from the education faculty of a private university in Northern Cyprus. A total of 105 students voluntarily participated. The results revealed a significant correlation among digital citizenship behaviours of students and their attitudes.

Memon et al. (2020) investigated perspectives of students on e-learning throughout the lockdown. The sample size of 377 students was used to collect data with online questionnaire. The research pointed out that 77% students have negative opinion towards e-learning, and 76% utilize mobile devices for their e-learning.

Maqableh et al. (2017) identified the key factors that might obstruct or assist the acceptance of e-learning among the students of university. The researchers developed a research model by extending the UTAUT with self-efficacy and trust. This sample had been collected from two universities students in England. The study's findings depicted that intentional behaviour was impacted positively by social influence, hedonic motivation, performance expectancy, effort expectancy, and self-efficacy.

Neskovic et al. (2017) assessed the components influencing students' attitudes towards e-learning. A well based survey was utilized to obtain the data. Regression analysis revealed that ease, content design and usefulness had an enormous effect on students' attitudes.

Abbas (2016) proposed a framework to examine instructor, external, and interpersonal impact on intentions to utilize e-learning among students in Egypt and the UK, representing developing and developed countries, respectively. The study involved hospitality and tourism students. Of the 700 students invited to participate, 468 responded, resulting in a 66.9% response rate. The study illustrated that all the three social factors substantively affected the usage intentions of Egyptian students. Conversely, only the instructor quality had a substantial influence on UK students' usage intentions.

Ali (2016) conducted a study to measure the readiness of 113 female nursing students selected through

purposive sampling technique. The outcomes stated that the vast majority of students had high readiness scores, with motivation being the lowest average score. Additionally, the study observed no significant difference in e-learning readiness among nursing students at various academic levels. However, students who preferred studying through e-learning exhibited statistically different average readiness scores.

Harandi (2015) investigated the association between e-learning and motivation among the study participants. This research focused on students from Tehran Alzahra University, representing various majors and educational levels. Using GPower3.1, the sample size was determined to be 140 students, and random sampling had been employed to gather data through a questionnaire, and Pearson's correlation coefficient had been employed to analyze the results. Studies findings demonstrated that e-learning had a favorable impact on students' motivation.

Rhema and Miliszewska (2014) explored the e-learning perceptions and experiences of engineering students at two universities in Libya. The study involved 348 undergraduate students from the departments of Petroleum Engineering Electrical Engineering at both universities. The comparative analysis revealed that students from both urban and rural areas had favorable attitudes for e-learning. Additionally, their study indicated that insignificant difference has been found in attitudes for ICT and e-learning on the basis of gender.

## **2.1 Research Gap**

E-learning has significantly transformed workplace learning over the past few years, enhancing efficiency, workflow, and collaboration. E-learning has been extensively implemented in classrooms across the educational sector, ranging from primary to university education, offering engaging and impactful courses (Vitoria et al., 2018). The literature review suggest that there are notable research gaps in understanding university students' attitudes about e-learning and gender differences in the Indian educational system. While research on this context exists across various fields and regions, there is dearth of comprehensive research that covers a diverse range of academic backgrounds and institutions within India. Existing research, often conducted in other countries, may not fully account for the unique cultural, social, and infrastructural components affecting attitudes toward e-learning in India. This study will focus on evaluating students' attitudes concerning e-learning at the university levels. Additionally, there has been limited exploration of gender differences in e-learning attitudes among Indian students, despite the country's diverse gender dynamics. As a result, this study will also explore gender differences in students' attitudes regarding e-learning.

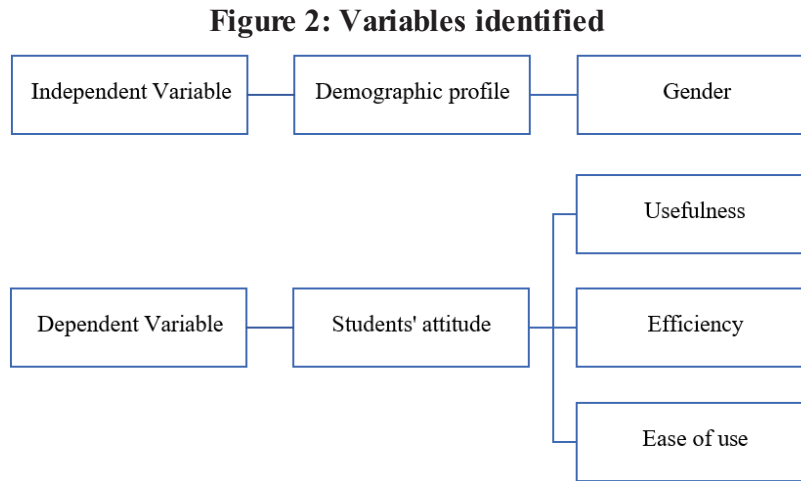
## **2.2 Objectives of the study**

By identifying the research gap, the following are objectives:

1. To determine students' attitude toward e-learning.

To examine gender-based differences in students' attitudes toward e-learning.

## 2.3 Variables Identified



*Source: Compiled by author*

## 3. RESEARCH METHODOLOGY

**Research design** – The current study adopts descriptive research design, making it well-suited for gaining deeper insights into the relatively underexplored topic of university students' attitudes toward e-learning. This research approach also enables for a thorough description of the characteristics.

**Sampling** – This study employs a purposive cum convenience sampling technique to choose participants. This approach combines purposive sampling, where individuals are chosen based on specific criteria (in this case, awareness of e-learning), with convenience sampling. The final sample comprises 105 respondents, of which 100 accurate responses have been included in the analysis. The participants have been drawn from Guru Nanak Dev University, Amritsar, offering diverse perspectives on attitudes toward e-learning. The data has been collected from Amritsar city.

**Data collection** – Primary data were gathered via self-administered questionnaire distributed through Google Forms. The questionnaire was divided into two sections: Section A addressed factors influencing students' attitudes toward e-learning, while Section B captured demographic information about the respondents. Attitudes toward e-learning have been assessed by utilizing a Likert scale ranging from 1 (strongly agree) to 5 (strongly disagree), enabling a detailed investigation of students' perceptions. The scales have been adapted from existing literature including Davis (1989) and Ali et al. (2016).

**Data analysis tools** – The data analysis employs a combination of quantitative methods, including percentages, mean scores, and graphical representations for descriptive analysis. For inferential

analysis, factor analysis is performed to identify the important elements determining students' attitudes about e-learning. The Bartlett's Test and Kaiser-Meyer-Olkin (KMO) measure are used to confirm data is adequate for factor analysis. Furthermore, Mann-Whitney U test is applied to evaluate gender-based disparities in attitudes toward e-learning, assuming the data's non-normal distribution.

**4. DATA ANALYSIS AND INTERPRETATION**

The data analysis has been bifurcated into three sections. Section I includes a descriptive analysis of the respondents' demographic profile. Section II focuses on factor analysis, and Section III employs the Mann-Whitney U test to evaluate the hypotheses.

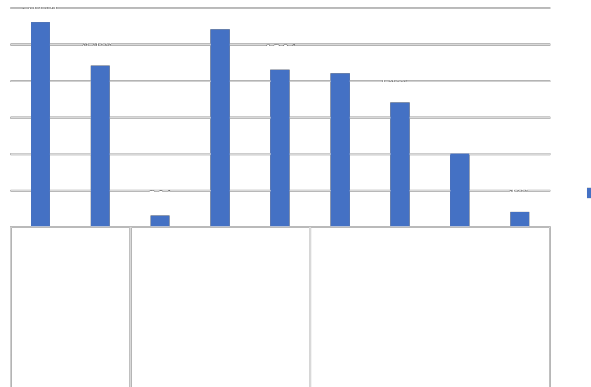
**4.1 Demographic Profile**

**Table 1: Respondents' Demographic Profile**

Demographic Constructs	Particulars	Number of Respondents	%
Gender	Female	44	44%
	Male	56	56%
Age	18 and below	3	3%
	19 to 21 years	54	54%
	Above 21	43	43%
Qualification	Undergraduate	42	42%
	Graduate	34	34%
	Postgraduate	20	20%
	Others	4	4%

Source: calculated by author

**Figure 3: Sample Characteristic**



Source: Compiled by author

## 4.2 Factor Analysis Results

Table 2 reveals that KMO is > 0.5 i.e. 0.893 which means it is adequate and Bartlett test of sphericity is significant (Kaiser, 1974). The approximate Chi-square value is 2022.371 with DF (degree of freedom) 210 which is significant at 0.000 levels. This tests show that data is appropriate.

**Table 2: KMO and Bartlett's Test**

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.893
Approx. Chi-Square	2022.371
Bartlett's Test of Sphericity df	210
Sig.	.000

Source: Author's own calculation with SPSS

**Table 3: shows that three factors have been drawn out and total variance is 72.072 cumulative.**

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
	1	12.437	59.224	59.224	12.437	59.224	59.224	5.821	27.719
2	1.513	7.206	66.430	1.513	7.206	66.430	4.775	22.738	50.457
3	1.185	5.641	72.072	1.185	5.641	72.072	4.539	21.614	72.072
4	.771	3.670	75.742						
5	.690	3.286	79.028						
6	.618	2.945	81.973						
7	.537	2.557	84.530						
8	.483	2.301	86.830						
9	.442	2.104	88.934						
10	.386	1.840	90.774						
11	.369	1.758	92.532						
12	.266	1.269	93.801						
13	.255	1.215	95.016						
14	.202	.963	97.042						
15	.190	.905	97.946						
16	.141	.672	98.619						
17	.076	.363	99.482						
18	.059	.279	99.761						
19	.050	.239	100.000						

Extraction Method: Principal Component Analysis.

The interpretation, based on the factor loadings presented in table 4, identifying the variables with high loadings on each factor. Factor 1 i.e. usefulness is the most important factor with 27.719 % variance explained. The 19 statements are classified under three factors – Usefulness, Efficiency and Ease of use as displayed in table 5.

**Table 4: Rotated Component Matrix**

	Components		
	1	2	3
S14	.772		
S16	.749		
S6	.738		
S17	.731		
S3	.722		
S13	.666		
S4	.652		
S12	.614		
S16		.824	
S18		.794	
S2		.782	
S15		.772	
S1		.740	
S10			.780
S9			.753
S8			.731
S7			.718
S11			.679
Extraction Method: PCM			

Source: Author's own calculation with SPSS

**Table 5: Naming of Factors**

<b>Factor-1 Usefulness</b>	<b>Factor-2 Efficiency</b>	<b>Factor-3 Ease of use</b>
9 statements are covered under this factor	5 statements are covered under this factor	5 statements are covered under this factor
-E-learning is beneficial. -I enjoy video instructions included in e-learning materials. -Hyperlinks in e-learning materials aid my learning process -I appreciate animations in e-learning materials.	-E-learning enhances my critical thinking skills. -E-learning boosts my learning efficiency -E-learning helps me strengthen my knowledge. -I am comfortable in utilizing e-learning.	-I find it easy to manage content of e-learning. -I am confident when accessing e-learning content. -I can easily find information in e-learning materials. -I find studying through e-learning to be easy.

-E-learning helps save time.  -E-learning can address many educational challenges..  -E-learning enhances access to learning materials.  -E-learning helps me catch up on missed lectures.  -My interaction with e-learning is to understand.	-I am proficient in handling e-learning functions.	-E-learning simplifies my learning process.
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Source: Author's own compilation

### 4.3 Hypothesis testing

#### 4.3.1 Hypotheses of the Study

$H_{01}$ :-There is no notable difference in the perception of usefulness based on gender

$H_{02}$ :- There is no notable difference in the perception of efficiency based on gender

$H^{03}$ :-There is no notable difference in the perception of ease of use based on gender

#### *Normality test*

**Table6: Shapiro-Wilk's Normality Test**

	W	P
Usefulness	0.814	< .001
Efficiency	0.778	< .001
Ease of use	0.830	< .001
<i>Note. A low p-value depicts an invalidation of the presumption of normality</i>		

In Table 6, p-value of the Shapiro-Wilk test for all three factors was below 0.001, which is under 0.05 thresholds. Subsequently, null hypothesis of normality was rejected, indicating that the data distributed was not normal. Mann-Whitney U test has been employed to test the hypotheses due to the non-normal distribution of data. This test is an alternative to the independent samples t-test to investigate whether there is a substantial variance in the means of two groups

**Table 7: Group Descriptives**

	Group	N	Median	Mean	SE	SD
Usefulness	1	56	0.197	0.0219	0.131	0.982
	2	44	0.197	-0.0278	0.156	1.033
Efficiency	1	56	0.433	-0.0167	0.148	1.106
	1	44	0.331	0.0213	0.129	0.858
Ease of use	1	56	0.496	0.0320	0.145	1.088
	2	44	0.252	-0.0408	0.134	0.886

Source: Author's own compilation

### ***The Mann Whitney U Test***

**Table 8: The Mann Whitney U test**

	W	Statistic	P	Mean difference
Usefulness	Mann-Whitney U	1185	0.742	-2.95e-5
Efficiency	Mann-Whitney U	1221	0.939	4.69e-6
Ease of use	Mann-Whitney U	1108	0.385	0.0564

Source: Author's Calculation using SPSS

Table 7. presents the descriptive statistics for usefulness, efficiency, and ease of use categorized by gender, while Table 8 illustrated the test statistic, p-value, and mean difference.

#### **Factor-1:- Usefulness**

$H_{01}$ :- There is no substantial difference in the usefulness with regard to gender.

The p-value for usefulness is 0.742, exceeding the significance level of 0.05. In turn, null hypothesis has been deemed valid, indicating insignificant difference in perceptions of usefulness between genders.

#### **Factor-2 :- Efficiency**

$H_{02}$ :- There is no substantial difference in efficiency regarding gender.

The p-value for efficiency was 0.939, which was greater than 0.05. As a result, null hypothesis has been approved, suggesting no substantial difference in perceptions of efficiency based on gender.

#### **Factor-3:- Ease of use**

$H_{03}$ :- There is no substantial difference in the ease of use with regard to gender.

The p-value for ease of use is 0.385, also exceeding 0.05. Thus, the null hypothesis has been accepted, signifying insignificant difference in perceptions of ease of use with regard to gender.

**Table 9: Hypothesis Results**

Factor	Hypothesis testing ( $H_0$ )	Result
Factor	Accept	There is no statistically substantial difference in perceptions of usefulness based on gender.
Efficiency	Accept	There is no statistically substantial difference in perceptions of efficiency based on gender.
Ease of use	Accept	There is no statistically substantial difference in perceptions of ease of use based on gender.

Source: Own compilation

## 5. Findings and conclusion

### 5.1 Findings of the study

The present study imparts useful insights into students' attitudes toward e-learning and its influence on demographic factors such as gender. The demographic analysis showed that 56% of the participants were male, and 44% were female. Most of those surveyed (54%) belonged to the 19–21 age group, representing a predominantly younger cohort. Regarding educational qualifications, the sample primarily included undergraduate students (42%), followed by graduate students (34%) and postgraduates (20%), with a small portion categorized as "others" (4%). The factor analysis, conducted using the Bartlett's Test of Sphericity and Kaiser-Meyer-Olkin (KMO) showed the data was appropriate for analysis, with strong KMO value of 0.897. This analysis identified three key factors influencing students' attitudes toward e-learning: ease of use, efficiency, usefulness which collectively depicted 74.503% of the variance. Further, due to the non-normal pattern of distribution of data, Mann-Whitney U test has been employed for examining the gender differences in attitudes among three factors. The findings exhibited no statistically significant differences among female and male students in respect of efficiency ( $p=0.939$ ), usefulness ( $p=0.742$ ), and ease of use ( $p=0.385$ ). This indicates that gender has no substantial impact on attitudes regarding e-learning.

### 5.2 Conclusion

E-learning platforms have been widely recognized in recent years for their enhanced features, accessibility and diversified offerings. The study has employed purposive cum convenience sampling for collecting primary data with the help of a questionnaire. Mann-Whitney U test and Factor analysis statistical tools have been utilized in the study. This study has employed a combination of exploratory and descriptive statistics to explore students' attitudes toward e-learning, focusing on gender-based differences. The findings demonstrated that students' attitudes are impacted by three key elements: ease of use, efficiency, and usefulness. Additionally, study noticed no substantial differences in attitudes between female and male students. The findings highlight the necessity of enhancing

easiness, usefulness, and efficiency to foster positive attitudes among students, which can be achieved by improving content quality, ensuring reliable and user-friendly platforms, and providing adequate support. The lack of significant gender-based differences suggests that efforts should be inclusive, addressing the diverse needs of all students. By focusing on these key factors, educational institutions and e-learning platform developers can improve the acceptability and potency of e-learning, ultimately supporting students' learning outcomes and goals. The theoretical contribution of the study is that it highlights the significance of efficiency, ease of use and usefulness in determining the attitudes of students towards e-learning, presenting recommendations for both practitioners and academic researchers aiming to boost overall digital learning experience. Additionally, the present study offers a better understanding of generality of attitudes regarding e-learning, suggesting that gender does not substantially influence attitudes and underlining the value of inclusive strategies in educational technology advancement.

### **5.3 Limitations of the study**

1. The findings of the present study are more relevant to students over the age of 18 years, which may limit its generalizability across all age groups.
2. The research focuses solely on analyzing gender distinctions in students' attitude regarding e-learning.
3. The study has been conducted by collecting data from single university of Punjab. Thus the results may not be generalizable.

### **5.4 Scope for future research**

Future research could greatly benefit from addressing the identified limitations in the study on students' attitudes toward e-learning. Firstly, conducting a larger-scale study involving a more diverse sample size from various universities across different regions would provide a broader understanding of attitudes towards e-learning among students. Additionally, exploring regional differences in attitudes could unveil unique cultural or contextual factors influencing perceptions of e-learning, offering valuable insights for tailored educational strategies. Exploring demographic factors beyond gender, such as age, academic major, or socioeconomic status, could further enrich our understanding of the diverse influences on attitudes toward e-learning. Cross-cultural analysis would allow for comparisons across different cultural contexts, shedding light on cultural factors shaping preferences for e-learning. Furthermore, investigating the impact of external factors like technology access and institutional support on attitudes towards e-learning is crucial for designing inclusive and effective educational policies and interventions. By addressing these avenues for future research, scholars can advance our understanding of students' attitudes regarding e-learning, ultimately contributing to the growth and progression of more tailored and prosperous e-learning approaches

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