

Attitudes of Secondary School Students Toward E-Learning: A Gender-Based Comparative Analysis

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Received: 20 Feb 2026 Accepted & Reviewed: 25 Feb 2026, Published: 28 Feb 2026

Abstract

The rapid expansion of information and communication technology (ICT) and the growing emphasis on digital education—particularly after the COVID-19 pandemic—have intensified the need to examine students' attitudes toward e-learning. In India, initiatives such as SWAYAM and DIKSHA have strengthened the digital learning ecosystem; however, the effectiveness of such efforts largely depends on learners' perceptions and acceptance. The present study aimed to examine and compare the attitudes of secondary school students toward e-learning with reference to gender. A quantitative approach employing the descriptive survey method was adopted. The sample comprised 120 Class X students (58 females and 62 males) selected through simple random sampling from C.B.S.E.-affiliated schools in Ghaziabad, Uttar Pradesh.

Data were collected using the *Attitude Towards E-Learning Scale* developed by Dimpal Rani (2015). The dimensions assessed included interest, perceived usefulness, ease of use, and confidence. Data were analyzed using mean, standard deviation, and independent samples t-test. The findings revealed that although male students obtained slightly higher mean scores across most dimensions, the differences were not statistically significant at either the 0.05 or 0.01 levels. Thus, the null hypotheses were accepted for overall attitude and all four dimensions. The study concludes that gender does not significantly influence secondary school students' attitudes toward e-learning. The findings highlight the importance of strengthening digital infrastructure, ensuring equitable access, and designing learner-centered e-learning environments to enhance effective implementation in secondary education.

Keywords: e-learning, Attitude, Secondary Education, Gender, ICT.

Introduction

The expeditious advancement of information and communication technology (ICT) has profoundly transformed educational systems globally. The integration of digital technologies into teaching-learning processes has led to the emergence and expansion of e-learning as an essential component of contemporary education. E-learning refers to the use of internet-based technologies and electronic resources to deliver instruction, enhance knowledge acquisition, and support learner engagement (Rosenberg, 2001; Wentling et al., 2000). The concept gained further prominence during the COVID-19 pandemic, when institutions globally transitioned to online platforms to ensure continuity of education (Dhawan, 2020).

In India, government initiatives such as SWAYAM, DIKSHA, and e-Pathshala have strengthened the digital learning ecosystem and promoted equitable access to online educational resources. However, the successful implementation of e-learning depends not only on technological infrastructure but also on students' attitudes, perceptions, and readiness to adopt digital modes of learning (Ouma et al., 2013). Attitude, defined as a predisposition to respond favorably or unfavorably toward a particular object or situation (Anastasi, 1968), plays a crucial role in shaping learners' engagement and acceptance of technology-based instruction.

Secondary school students represent a critical group for examining such attitudes, as adolescence is a formative stage characterized by cognitive development and increased academic responsibility. Understanding their perceptions of e-learning is essential for designing inclusive and effective digital education strategies. Research conducted on university students indicates that students' perceptions of usefulness, ease of use, confidence, and interest significantly influence their willingness to adopt e-learning systems (Liaw & Huang, 2011; Ong & Lai, 2006). Positive attitudes toward e-learning are associated with improved learning outcomes and deeper approaches to study (Ellis et al., 2009). Nevertheless, empirical findings regarding gender differences in attitudes toward e-learning remain inconsistent. While some studies report significant variations across gender (Rizwana & Singh, 2016), others find no meaningful differences (Jasper et al., 2012).

Numerous studies indicate that research on gender differences in technology acceptance has produced contradictory and inconsistent findings across various contexts, highlighting the need for more focused investigation. This inconsistency is evident across different technologies. For example, C. V. Slyke et al. (2005) identified gender differences in e-commerce adoption with respect to perceived compatibility and visibility but found no differences regarding perceived ease of use. Likewise, C. Sindermann et al. (2020), in their study of 686 participants, reported that gender did not significantly moderate the relationship between personality and smartphone acceptance, except in the case of altruism. More recently, Sulaimon Adewale et al. (2025) observed that gender moderated certain UTAUT constructs (performance expectancy and facilitating conditions) in the context of e-supervision adoption, but not others (effort expectancy). Collectively, these varied findings across technologies and contexts reinforce the conclusion that inconsistency remains a defining characteristic of the literature. Furthermore, these studies have reported inconsistent findings regarding gender differences in technology acceptance, highlighting the need for focused investigation.

Therefore, examining gender-based differences in attitudes toward e-learning with respect to interest, perceived usefulness, ease of use, and confidence is important to support inclusive planning. The findings of this study may guide educators and policymakers in strengthening digital readiness and enhancing the quality of secondary education in a technology-driven era. In light of these considerations, the present study seeks to examine and compare the attitudes of secondary school students toward e-learning with reference to gender.

Objectives of the study

- 1.0 To study the difference between the attitudes of male and female students towards e-learning.
- 1.1 To study the difference between the attitudes of male and female students towards 'e-learning interest.'
- 1.2 To study the difference between the attitudes of male and female students towards the 'usefulness' of e-learning.
- 1.3 To study the difference between the attitudes of male and female students towards 'ease of e-learning.'
- 1.4 To study the difference between the attitude of male and female students towards 'e-learning confidence.'

Hypotheses of the study

- 1.0 There is no significant difference between the attitudes of male and female students towards e-learning.
- 1.1 There is no significant difference between the attitudes of male and female students towards 'e-learning interest.'
- 1.2 There is no significant difference between the attitudes of male and female students towards the 'usefulness of e-learning.'

1.3 There is no significant difference between the attitudes of male and female students towards 'ease of e-learning.'

1.4 There is no significant difference between the attitudes of male and female students towards 'e-learning confidence.'

Methodology of The Study

The present study is quantitative in nature and seeks to examine the attitudes of secondary school students toward e-learning. In accordance with the objectives of the research, the descriptive survey method was used.

Population and Sample of the study

The population of the present study comprised all Class X students enrolled in CBSE-affiliated secondary schools in Ghaziabad city. To ensure representativeness and enable generalization of findings to the larger population, the present study employed a probability sampling technique. The sample was drawn from secondary school students studying in Class X in CBSE-affiliated schools located in Ghaziabad city. A comprehensive list of all 240 CBSE secondary schools in Ghaziabad was obtained from the official CBSE website, which served as the sampling frame.

Using the simple random sampling technique, the 05 schools were selected through the lottery method to eliminate selection bias and provide equal opportunity to all units in the population. From each selected school, one section of Class X was randomly chosen using the same lottery method. Subsequently, systematic random sampling was applied to select 20 students (male and female) from each selected section. The final sample comprised 120 students, including 58 female and 62 male students. Prior permission was obtained from the concerned school authorities before administering the research instrument. The selected students were informed about the purpose of the study, and the data were collected systematically using the standardized attitude scale during regular school hours.

Research Tool used

The "Attitude Towards E-Learning Scale," developed by Dimpal Rani (2015), was used to collect the data.

Variables used in the study

(a) Independent variable—Gender

(b) Dependent variable—Attitude towards E-Learning

Statistical Technique Used:

The statistical technique 't-test of significance' has been used to analyze the data.

Analysis and Interpretation of data

Hypothesis 1.0

Hypothesis 1.0 is read as "*There is no significant difference between the attitudes of male and female students towards e-learning.*" This hypothesis has been tested by employing a 't' test of significance. The major value of the 't' test was as follows:

Table -1.0

Gender	N	Mean	S.D.	't'	Description
Male	62	224.14	10.99	0.0013	The null hypothesis was accepted at both the levels of significance
Female	58	209.58	19.42		

Attitude of male and female students towards e-learning:

Table value at $df = 118$

At 0.05 level of significance = 1.98

At 0.01 level of significance = 2.62

Table 1.0 presents the comparison of mean scores of male and female students on their attitude toward e-learning. The calculated t-value (0.0013) was found to be lower than the critical values at both the 0.05 (1.98) and 0.01 (2.62) levels of significance ($df = 118$). Hence, the null hypothesis was accepted. It was concluded that gender does not significantly influence the overall attitude of secondary school students toward e-learning.

Hypothesis 1.1

Hypothesis 1.1 is read as "*There is no significant difference between the attitudes of male and female students towards e-learning interest.*" This hypothesis has been tested by employing a 't' test of significance. The major value of the 't' test was as follows:

Table 1.1

Gender	N	Mean	S.D.	't'	Description
Male	62	44.18	3.74	0.18	The null hypothesis was accepted at both the levels of significance
Female	58	42.96	5.91		

Attitude of male and female students towards e-learning interest:

Table value at $df = 118$

At 0.05 level of significance = 1.98

At 0.01 level of significance = 2.62

Table 1.1 presents the comparison of mean scores of male and female students on their attitude toward e-learning interest. The calculated t-value (0.18) was lower than the table values at both levels of significance. Therefore, the null hypothesis was accepted. This indicates that gender does not significantly influence the overall attitude of secondary school students toward e-learning interest.

Hypothesis 1.2

Hypothesis 1.2 is read as “*There is no significant difference between the attitudes of male and female students towards the usefulness of e-learning.*” This hypothesis has been tested by employing a ‘t’ test of significance. The major value of the ‘t’ test was as follows:

Table 1.2

Gender	N	Mean	S.D.	‘t’	Description
Male	62	83.76	7.11	0.069	The null hypothesis was accepted at both the levels of significance
Female	58	80.36	12.59		

Attitude of male and female students towards the ‘usefulness of e-learning’:

Table value at $df = 118$

At 0.05 level of significance = 1.98

At 0.01 level of significance = 2.62

Table 1.2 presents the comparison of mean scores of male and female students on their attitude towards the usefulness of e-learning. The obtained t-value (0.069) was less than the critical values at the 0.05 and 0.01 levels. Hence, the null hypothesis was accepted, and it was concluded that gender does not significantly affect students’ perception of the usefulness of e-learning.

Hypothesis 1.3

Hypothesis 1.3 is read as “*There is no significant difference between the attitudes of male and female students towards ‘ease of e-learning.’*” This hypothesis has been tested by employing a ‘t’ test of significance. The major value of the ‘t’ test was as follows:

Table 1.3

Gender	N	Mean	S.D.	't'	Description
Male	62	52.08	4.94	0.068	The null hypothesis was accepted at both the levels of significance
Female	58	46.53	5.60		

Attitude of male and female students towards 'ease of e-learning':

Table value at $df = 118$

At 0.05 level of significance = 1.98

At 0.01 level of significance, = 2.62

Table 1.3 presents the comparison of mean scores of male and female students on their attitude toward 'ease of e-learning'. The calculated t-value (0.068) did not exceed the required table values. Therefore, the null hypothesis was accepted. It was inferred that male and female students have similar perceptions regarding the ease of e-learning, or it is to be said that gender does not significantly influence the attitude of secondary school students toward 'ease of e-learning.'

Hypothesis 1.4

Hypothesis 1.4 is read as "*There is no significant difference between the attitudes of male and female students towards e-learning confidence.*" This hypothesis has been tested by employing a 't' test of significance. The major value of the 't' test was as follows:

Table 1.4

Gender	N	Mean	S.D.	't'	Description
Male	62	44.13	3.91	0.013	The null hypothesis was accepted at both the levels of significance
Female	58	39.72	5.46		

Attitude of male and female students towards 'e-learning confidence':

Table value at $df = 118$

At 0.05 level of significance = 1.98

At 0.01 level of significance = 2.62

Table 1.4 presents the comparison of mean scores of male and female students on their attitude toward 'e-learning confidence.' The calculated t-value (0.013) was lower than the critical values at both levels of significance. Thus, the null hypothesis was accepted. The study indicated that gender does not significantly influence the attitude of secondary school students toward e-learning confidence.

Findings

The study reveals that no significant gender-based differences exist in overall attitude toward e-learning or in any of its dimensions—interest, usefulness, ease of use, and confidence—among secondary school students.

Discussion

The reasons for these findings may be the post-pandemic normalization of online learning and changing social perspectives, due to which both male and female students get equal access to technology and a uniform educational environment. Perceived practical benefits of e-learning are also matters in increasing the students' positive attention towards e-learning irrespective of gender. Comparable ICT skills of students also affect their attitudes towards e-learning. The previous studies conducted by Konwar (2017), Doley & Das (2018), Thirumorthy (2021), and Srivastava (2023) also did not find any significant difference on gender basis, as they reported that gender does not significantly influence the overall attitude of students toward e-learning. However, the results of the studies conducted by Anditiarina et al. (2021), Sánchez and Karaksha (2022), Yu & Deng (2022), and Gosavi (2025) reported a significant difference between the attitudes of students on gender basis towards e-learning.

Educational Implications

- The study emphasizes the importance of organizing orientation programs and training workshops to develop a positive attitude among students toward e-learning.
- The findings of the study also highlight the necessity of providing adequate IT infrastructure, reliable internet connectivity, and essential technical skill development for both teachers and students.
- The findings of the study imply the need for systematic integration of e-learning into the existing educational framework through appropriate policy reforms and institutional restructuring.
- Moreover, e-learning platforms should be designed to be user-friendly, interactive, and engaging in order to enhance students' acceptance and effective utilization of digital learning resources.

Conclusion

The overall attitude of secondary school students toward e-learning was found to be positive in nature. Although mean scores of male students were slightly higher across most dimensions, these differences were not statistically significant. Gender was not found to be a determining factor influencing secondary school students' attitudes toward e-learning. Such findings suggest that gender may not be a determining factor in shaping secondary school students' attitudes toward e-learning, and both male and female students exhibit comparable readiness and acceptance of digital learning environments. Therefore, educational planning and policy development can adopt a gender-neutral approach while promoting digital learning initiatives.

Suggestions for further research

- Future research may broaden the scope by including students from different educational boards, varied geographical regions, and multiple grade levels.

- Research also can be conducted to examine the relationship between students' knowledge, academic achievement, and attitudes toward e-learning across diverse populations to enhance generalizability and support evidence-based educational planning.

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