Journal of Extension Systems
Year 2025, Volume-41, Issue-2 (Jul-Dec)

DOI: 10.48165/jes.2025.41.2.2

*ISSN 0970-2989* ***(Print)***
*ISSN 2582-273X* ***(Online)***

# Attitude of Agriculture Students Towards E-Learning: Factors, Perceived Prospects and Adoption

Holy Mercy Divina Matla[1], Ashutosh Jena[2], Smitha K. P.[3] and Allan Thomas[4*]

[1,2]PhD Scholar, Department of Agricultural Extension Education, College of Agriculture, Vellayani. Kerala Agricultural University. Thiruvananthapuram, Kerala – 695522
[3]Assistant Professor (Agricultural Extension), Krishi Vigyan Kendra, Thrissur, Kerala -680656
[4]Professor and Head Department of Agricultural Extension Education, College of Agriculture, Vellayani. Kerala Agricultural University. Thiruvananthapuram, Kerala – 695522

## ARTICLE INFO

**Keywords:** E-learning; Learning behaviour; Digital education; Online learning.

## ABSTRACT

In the era of digital transformation, e-learning has become integral to higher education, yet its effective adoption among agricultural students remains underexplored. This study aims to assess the attitude of undergraduate students towards e-learning, identify the influencing socio-economic factors, and analyse the extent of adoption of e-learning platforms at the College of Agriculture, Vellayani, Kerala Agricultural University. A total of 120 final-year B.Sc. (Hons.) Agriculture students were surveyed using a structured and pre-tested interview schedule. Data were analysed using descriptive statistics, correlation and chi-square tests. Results revealed that 67.5 percent of students exhibit a medium level of attitude towards e-learning, while 15 percent had a high attitude. Significant positive correlations were observed between attitude and factors such as father's education (r=0.861*), computer availability at home (r=893**), computer availability at college (r=0.962**), and internet use purpose (r=0.904**). In terms of adoption, higher proportions of students reported high relative advantage (26.67%) and compatibility (55.84%), while lower demonstrability (26.67%) and visibility 940%) indicated usability challenges. Gender differences were statistically insignificant ($\chi^2$ = 0.708, p = 0.702; Cramér's V = 0.077), though girls showed a slightly higher mean attitude (Cohen's d = –0.4). the findings highlight that while students are technologically ready and moderately positive towards e-learning, challenges remain in enhancing use-friendliness, accessibility, and demonstrability. The study underscores future research related to the importance of strengthening institutional support and user-oriented design to foster inclusive and effective digital leaning in agricultural education.

## Introduction

Education plays a vital role in the nation-building process, and in India, significant measures were implemented by the government post-independence to ensure its accessibility to all. Education directly or indirectly impacts every facet of human existence (Moubayed et al., 2020; Khan, 2017; Odeshi, 2014). The Government of India established several committees and commissions to propose crucial measures aimed at enhancing the educational quality within the country (Ahmadpour et al., 2016; Basumantary, 2018). And the utilization of the internet has significantly accelerated the process of communication among individuals, ultimately fostering a sense of global interconnectedness (Pathak et al.,

Corresponding author; Allan Thomas,
Email: t.allan@kau.in

2019; Sabah, 2013). Moreover, technology facilitates knowledge sharing, allowing individuals to impart their expertise to others for mutual benefit (Rajabalee and Santally, 2021; Mutisya and Makokha, 2016). According to Saroha (2013), E-Learning can be described as the integration of educational principles with the methodical implementation of information technology. It provides individuals with the flexibility to work from their own location (Dhamija, 2014; Saba, 2012; Sewando et al., 2023). Several studies (Ramirez et al., 2015; Hanif et al., 2018; Kar et al., 2014) have focused on e-learning in Indian higher education, emphasizing its comparative advantages over traditional classroom methods. However, most of them have either generalized findings across disciplines or highlighted infrastructural limitations without analysing attitudinal, socio-economic, and adoption level factors in context-specific educational settings such as agricultural universities (Khan, 2017; Shatnawi et al., 2014). Additionally, effective solutions to problems that must be solved for its adoption and execution have not been provided. This creates a critical research gap concerning how agricultural students, who require both theoretical and practical learning, perceive, accept, and adopt e-learning platforms. Furthermore, few studies have explored how socio-economic and institutional factors interact to shape student's e-learning attitudes and adoption behaviour (Eze et al., 2020; Chang et al., 2023).

Based on this gap, the present study hypothesizes that: $H_1$ - Socio-economic factors influence student's attitude towards e-learning. And $H_2$ - A positive attitude towards e-learning is associated with a higher level of adoption of e-learning platforms among agricultural students. With this background, the present study was undertaken to: (i) Delineate the influencing socio-economic factors that affect the attitude of agriculture students towards e-learning systems; (ii) Assess the relationship between student's attitude towards e-learning and influencing socio-economic factors; and (iii) Analyse the extent of adoption of various e-learning platforms by the students.

# Materials and methods

***Selection of study area and respondents*** – the study was conducted at the College of Agriculture, Vellayani, under Kerala Agricultural University located in Thiruvananthapuram district, Kerala, India. Thiruvananthapuram, known for its robust educational infrastructure and high digital literacy offers an ideal setting for examining students' engagement with e-learning. The district has high broadband and mobile internet services, and several government-led e-learning initiatives are actively implemented in educational institutions, thereby providing conducive environment for studying digital learning behaviour among students. The study specifically targeted final year B.Sc. (Hons.) Agricultural students, as they represent a cohort with maximum exposure to both traditional and digital modes of learning. Respondents were selected using a purposeful random sampling technique. The 'purposeful' element ensured that only students who had experienced e-learning has a part of their curriculum were included, thereby guaranteeing relevance to the study objectives. Within this group, a random selection procedure was followed to eliminate selection bias and ensure representativeness of the student population. A total of 120 students were selected for the study.

***Research design*** – The study employed a quantitative descriptive-correlational research design, which was appropriate for examining the relationship between socio-economic factors, student's attitude, and level of adoption of e-learning platforms. The descriptive component was used to characterize the socio-economic profile of students, their accessibility to digital resources, and their attitude levels towards e-learning. The correlational component sought to determine the degree and direction of relationships between these factors and students' attitude towards e-learning.

***Research administration*** - A well-structured and pre-tested interview schedule was constructed with consultation with subject-matter experts. The interview schedule comprised of three main sections viz., (i) general and socio-economic characteristics of the respondents (ii) attitude of students towards e-learning (iii) adoption of various e-learning platforms.

## *Data analysis and measurement of variables*

***General and socio-economic factors*** - In this study, the variables used for the profiling were gender, father's education, mother's education, father's occupation, annual income, family type, computer availability at home, internet accessibility, internet use experience, computer availability at college, time spent on internet, and internet use purpose. The variables were decided after consulting relevant literature, and discussion with the experts. After expert opinion, relevancy rating (Equ.1) was conducted and the variables having greater than 80 percent were retained for the study. Primary data on these variables obtained from the survey were analysed using various descriptive statistical tools.

Relevancy = (Total scores obtained on each item)/(Maximum possible score)*100 (Equ.1)

***Attitude of students towards e-learning*** – the attitude towards e-learning platforms was operationalised as "the psychological, mental and emotional complex that acts as personal predisposition behaviour towards e-learning objects or situation whether favourable, unfavourable or neutral. The attitude of students was analysed using the standard scale attitude developed by Torun, (2020). Further, Pearsons corelation was also conducted between the attitude of students towards e-learning and the factors influencing the e-learning attitude to get a better understanding of the

factors that mainly affect the students' attitude.

***Adoption of e-learning platforms*** – adoption of e-learning platforms was operationalised as "the decision-making process to make full use of an innovation as the best course of action available". A five-point Likert continuum scale was used to record their responses for the statements based on 5 Adoption-Innovation characteristics, *i.e.*, Relative advantage, compatibility, Ease of use, demonstrability and visibility (Mohammed *et al.*, 2022). Descriptive statistics were used to measure the extent of adoption of various e-learning platforms by agriculture students.

***Statistical analysis*** - Cohen's *d* (Equ.2) was calculated to compare the e-learning attitude and e-learning tools adoption scores of B.Sc. (Agriculture) boys and girls to understand the measuring effect size between two groups.

$$\text{Cohen's } d = M_1 - M_2 / SD_{pooled} \quad \text{(Equ.2)}$$

Where, $M_1$ = Mean score of group 1

$M_2$ = Mean score of groups 2

$SD_{pooled}$ = Pooled standard deviation of both groups

$SD_{pooled}$ = √(((n1-1) □SD1□^(2 )+(n2-1)□SD2□^2)/(n1+n2-2))

Where, $SD_1$ = Standard deviation of group 1

$SD_2$ = Standard deviation of group 2

$N_1$ = Number of group 1

$N_2$ = Number of group 2

Further, to examine if the level of e-learning adoption is independent of gender, i.e., do male and female students differ significantly in their adoption levels, a chi-square (Equ. 3) test was also performed.

$$\chi^2 = \sum (O_i - E_i)^2 / E_i \quad \text{(Equ.3)}$$

Where, $O_i$ = Observed frequency in each category

$E_i$ = Expected frequency in each category

$\sum$= Summation over all categories

$E_i$ = (Raw total*Column total)/ Grand total

# RESULTS AND DISCUSSION

## Socio-economic factors affecting the use and attitude towards e-learning of the respondents

***Parents education*** – parent's education is operationalised as the number of formal education years received by the respondent's parents. They were classified into 6 categories (Table 3.1). Majority of the them had a secondary school level of education, followed by those with graduation education, degree, and higher secondary respectively. It was interesting to note that none of them were found illiterate. None were found illiterate and majority had completed education more than degree level. These results denote the effect of educated parents, who can guide their children in navigating online learning platforms, understanding academic content and providing additional assistance when needed. Similar results were observed by Cakir and Slak, (2015) and Dhas, (2017).

Table 3.1. Distribution of the respondent's parents' education level status

| Category | Frequency (N=120) | | Percentage (N=100) | |
|---|---|---|---|---|
| | Father | Mother | Father | Mother |
| < 9th | 11 | 11 | 9.16 | 9.16 |
| 10th | 27 | 31 | 22.50 | 25.83 |
| 11th - 12th | 19 | 20 | 15.83 | 16.67 |
| Diploma | 24 | 21 | 20.00 | 17.5 |
| UG | 25 | 28 | 20.83 | 23.33 |
| PG | 14 | 7 | 11.67 | 5.83 |
| Total | 120 | 120 | 100 | 100 |
| Above Mean (>13) | 63 | 56 | 52.5 | 46.67 |
| Below Mean (<13) | 57 | 64 | 47.5 | 53.33 |
| Total | 120 | 120 | 100 | 100 |
| Primary school | 1 | 1 | 0.83 | 0.83 |
| Secondary school | 37 | 43 | 30.83 | 35.83 |
| Higher secondary | 19 | 20 | 15.83 | 16.67 |
| Degree | 24 | 21 | 20 | 17.5 |
| Graduation | 25 | 28 | 20.83 | 23.33 |
| PG | 14 | 7 | 11.67 | 5.83 |
| Total | 120 | 120 | 100 | 100 |

| | | | | |
|---|---|---|---|---|
| <10th standard | 11 | 13 | 9.17 | 10.83 |
| 10th -12th standard | 46 | 51 | 38.33 | 42.5 |
| >Degree | 63 | 56 | 52.5 | 46.67 |
| **Total** | **120** | **120** | **100** | **100** |

***Father's occupation*** - The respondents were classified in to two categories (Table 3.2) based on their means of livelihood. More than half of the respondents (85%) cited secondary occupations such as, business, skilled work, labour, and service as the primary means of income. Only a meagre (15%) has been doing agriculture as their primary occupation. This reflects the flexibility of work schedule that effects the level of supervision and support available during students online learning sessions. Moreover, it impacts the availability of e-learning resources, better access to technology and conducive learning environment. This might be one of the reasons for students being more open and aware of various online and e-learning aspects. Similar results were also observed by Hanif et al., 2018 and Kamarulzaman et al., 2011.

Table 3.2. Distribution of the students based on their means of father's occupation

| Category | Frequency | Percentage |
|---|---|---|
| Agriculture | 18 | 15 |
| Non-agriculture | 102 | 85 |
| Total | 120 | 100 |
| Above mean (>1.8) | 102 | 85 |
| Below mean (<1.8) | 18 | 15 |
| **Total** | **120** | **100** |

***Annual income*** - The results revealed that annual income of majority of the respondent's parents (34.16%) had more than one lakh Rs/annum, and 27.5 percentage having between fifty thousand to one lakh Rs/annum of income. Very minor percent (Table 3.3) of 18.3% has less than fifty thousand Rs/annum of income. This implies that higher-income families have more resources to provide the necessary technology and internet access. Whereas, lower-income families might face challenges in affording these resources potentially impacting the students access to e-learning platforms. Similar results were reported by Mohammed et al., (2022) and Ogunnowo, (2016).

Table 3.3. Distribution of the students based on annual income of parents

| Category | Frequency | Percentage |
|---|---|---|
| <50000 | 22 | 18.33 |
| 50000-100000 | 33 | 27.5 |
| 1 lakh – 5 lakhs | 41 | 34.16 |
| 6 lakh – 10 lakhs | 24 | 20.0 |
| **Total** | **120** | **100** |
| Above mean (>2.4) | 65 | 54.17 |
| Below mean (<2.4) | 55 | 45.83 |
| **Total** | **120** | **100** |

***Computer accessibility*** - Out of 120 students, majority of the respondents (Table 3.4) i.e., 106 students (88.33%) have 4G mobiles, personal laptops and personal computers at home. And 11.67 percent of the surveyed students, lack accessibility to such e-learning tools. This disparity in access can be attributed to various factors like financial constraints, unstable internet connection, and geographical limitations (Peyman and Dehghani, 2014). The existence of a digital divide, disparities in technology access and personal preferences for traditional) contribute to the lack of accessibility. To address these issues, targeted initiatives such as providing financial aid, improving internet infrastructure, conducting awareness campaigns, and offering alternative learning options could help bridge the digital gap and ensure equitable educational opportunities for all students.

Table 3.4. Distribution of the students based on computer accessibility

| Category | Frequency | Percentage |
|---|---|---|
| Accessible | 106 | 88.33 |
| Not accessible | 14 | 11.67 |
| Total | 120 | 100 |
| Above mean (>1.9) | 106 | 88.33 |
| Below mean (<1.9) | 14 | 11.67 |
| **Total** | **120** | **100** |

***Computer availability at home and college*** - Notably, 75 percent of the respondents have computers available at home, while 90 percent have access to computers at college (Table 3.5). On the other hand, 25 percent report not having computers at home, and 10 percent lack computer access at college. The unavailability of computers at home could be from financial constraints, limited space (Suri and Sharma, 2013), or preference for using shared computing facilities at educational institutions. These issues could be addressed through initiatives involving financial support, ensuring sufficient computing facilities in educational institutions, and promoting awareness about personal computing devices for academic purposes. This can guide targeted efforts to enhance digital access and support a more inclusive e-learning environment.

Table 3.5. Distribution of respondents based on computer availability at home/college

| | At home | | At college | |
|---|---|---|---|---|
| **Category** | **Frequency** | **Percentage** | **Frequency** | **Percenage** |
| Available | 90 | 75 | 108 | 90 |
| Not available | 30 | 25 | 12 | 10 |
| **Total** | **120** | **100** | **120** | **100** |
| Above mean (>1.8) | 90 | 75 | 108 | 90 |
| Below mean (<1.8) | 30 | 25 | 12 | 10 |
| **Total** | **120** | **100** | **120** | **100** |

***Internet availability*** - The results (Table 3.6) showed that out of 120 students 105 of them had internet availability which is 87.5 percent. The respondents stated that the internet has come useful in their academic challenges, accessing emails, and to update original antivirus packages. At home and hostels they use WiFi and cable connections to access to high bandwidth internet connection. Minor rate of students (12.5%) had no proper internet connectivity. The reasons behind the unavailability could be multifaceted (Subedi et al., 2020). Such as students in remote areas may face challenges accessing stable internet services, disparities in socio-economic backgrounds, and students lack of means to obtain internet connectivity. Educational sector may need to address these barriers through initiatives like providing subsidies for internet services, improving infrastructure in remote areas, and promoting digital literacy to ensure equitable access to online resources.

Table 3.6. Distribution of the students based on internet availability

| Category | Frequency | Percentage |
|---|---|---|
| Available | 105 | 87.5 |
| Not available | 15 | 12.5 |
| Total | 120 | 100 |
| Above mean (>1.9) | 105 | 87.5 |
| Below mean (<1.9) | 15 | 12.5 |
| **Total** | **120** | **100** |

***Internet use experience*** - For how long the respondents have been using the internet for various purposes was studied and divided them into 3 categories (Table 3.7). Results showed that, majority of them (38.33%) have been using for nearly 5 years and 36.67 percent of them have been using nearly 10 years and 25 percent were using for more than 10 years. The existence of students with more than 10 years of internet use suggests that they have likely grown up with increasing internet usage over the years (Unger and Meiran, 2020). These individuals might have started using the internet at a young age, possibly due to early exposure to technology and evolving educational trends. This may have developed advanced digital skills and comfort with online platforms, potentially contributing to their extended internet use.

Table 3.7. Distribution of the students based on internet use experience

| Category | Frequency | Percentage |
|---|---|---|
| 1-5 yr. | 46 | 38.33 |
| 5-10 yrs. | 44 | 36.67 |
| >10 yrs. | 30 | 25 |
| Total | 120 | 100 |
| Above mean (>1.9) | 74 | 61.67 |
| Below mean (<1.9) | 46 | 38.33 |
| **Total** | **120** | **100** |

***Time for internet*** - Based on the time spent, the respondents were divided into 3 categories (Table 3.8). Out of 120 students, majority of the respondents (59.17%) use internet for 1-5 hours, 32.5 percent use for 5- 10 hours and very few (8.33%) uses for nearly more than 10 hours. Similar findings were reported by Gupta and Sharma, (2018) conducted on "Recognition and utility of new media by students" which showed that 83.3 percent were daily users. There was also a comparison (Table 3.9) made between the boys and girls regarding the time spent on internet and the results showed that 33.33 percent of girls were using for 1-5 hours and only 25.83 percent of boys using for 1-5 hours. But comparatively, boys using for 5-10 hours more (20%) than girls (12.5%).

Table 3.8. Distribution of the students based on time spent on internet

| Category | Frequency | Percentage |
|---|---|---|
| 1-5 hr | 71 | 59.17 |
| 5-10 hr | 39 | 32.5 |
| >10 hr | 10 | 8.33 |
| Total | 120 | 100 |
| Above mean (>1.5) | 49 | 40.83 |
| Below mean (<1.5) | 71 | 59.17 |
| **Total** | **120** | **100** |

Table 3.9. Comparison of the students based on time spent on internet

| Category | Frequency | | | Percentage | | |
|---|---|---|---|---|---|---|
| | **Total** | **Boys** | **Girls** | **Total** | **Boys** | **Girls** |
| 1-5 hr | 71 | 31 | 40 | 59.17 | 25.83 | 33.33 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 5-10 hr | 39 | 24 | 15 | 32.5 | 20 | 12.5 |
| >10 hr | 10 | 5 | 5 | 8.33 | 4.17 | 4.17 |
| Total | 120 | 60 | 60 | 100 | 50 | 50 |
| Above mean (>1.5) | 49 | 29 | 20 | 40.83 | 24.17 | 16.67 |
| Below mean (<1.5) | 71 | 31 | 40 | 59.17 | 25.83 | 33.33 |
| **Total** | **120** | **60** | **60** | **100** | **50** | **50** |

***Internet use purpose*** - The table 3.10 delineates the distribution of students based on their internet use purposes. Predominantly, students engaged in internet activities for academic preparation (95%), online shopping (95%), and email communication (80%). This shows the crucial role internet plays in supporting academic functions, facilitating communication, and providing a platform for online transactions. A significant portion of students (86.67%) also utilize the internet for railway-related activities, indicating the importance of online services for travel and transportation. Furthermore, entertainment, including watching movies, short clips, skill development, and shows, is a universal internet use purpose among all surveyed students (100%). Social media engagement is observed in 69.17 percent of the respondents, highlighting the role of online platforms in enhancing social connections (Jyothi and Vijayabhinandhana, 2021). The data emphasizes the diverse and essential functions of the internet in students' lives, serving both academic and recreational needs, with educational, informational, and leisure-driven online activities. Additionally, they have been using internet for writing documents, processing software's, performing calculations, publishing blogs, having video classes, using cloud-based storage and for uploading content. A complete comparison results between boys and girls on internet use purpose was also delineated as shown in table 3.11.

Table 3.10. Distribution of the students based on internet use purpose

| **Category** | **Frequency/120** | **Percentage/100** |
|---|---|---|
| Academic preparation | 114 | 95 |
| E-mail | 96 | 80 |
| Online shopping | 114 | 95 |
| Research work | 50 | 41.67 |
| Railway | 104 | 86.67 |
| Entertainment (Movie, Short clips, soft skill development, shows) | 120 | 100 |
| Social media | 83 | 69.17 |
| | **Level of internet use** | |
| Low (<5) | 21 | 17.5 |
| Medium (=5) | 21 | 17.5 |
| High (>5) | 78 | 65 |
| **Total** | **120** | **100** |
| Above mean (>5.7) | 78 | 65 |
| Below mean (<5.7) | 42 | 35 |
| **Total** | **120** | **100** |

Table 3.11. Comparison of the students based on internet use purpose

| **Category** | **Frequency/120** | | | **Percentage/100** | | |
|---|---|---|---|---|---|---|
| | **Total/120** | **Boys/60** | **Girls/60** | **Total/100** | **Boys/50** | **Girls/50** |
| Academic preparation | 114 | 59 | 55 | 95 | 49.17 | 45.33 |
| E-mail | 96 | 43 | 53 | 80 | 35.83 | 44.17 |
| Online shopping | 114 | 54 | 60 | 95 | 45 | 50 |
| Research work | 50 | 28 | 22 | 41.67 | 23.33 | 18.33 |
| Railway | 104 | 56 | 48 | 86.67 | 46.67 | 40 |
| Entertainment | 120 | 60 | 60 | 100 | 50 | 50 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Social media | 83 | 44 | 39 | 69.17 | 36.67 | 32.5 |

**Level of internet use**

| Category | Frequency | | | Percentage | | |
|---|---|---|---|---|---|---|
| | **Total** | **Boys** | **Girls** | **Total** | **Boys** | **Girls** |
| Low (<5) | 21 | 10 | 11 | 17.5 | 8.33 | 9.17 |
| Medium (=5) | 21 | 10 | 11 | 17.5 | 8.33 | 9.17 |
| High (>5) | 78 | 40 | 38 | 65 | 33.34 | 31.66 |
| **Total** | **120** | **60** | **60** | **100** | **50** | **50** |

## Attitude of the respondents towards e- learning

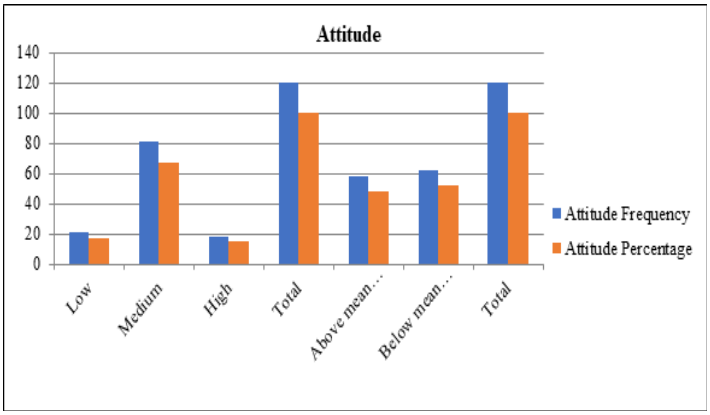
According to the attitude level of students towards e-learning (Table 3.12), the students were classified into three categories. Based on the survey results, the majority of the students (67.5%) had a medium level of attitude, followed by students with high level of attitude (15%). A considerable number of students (17.5%) had low level attitude towards e-learning (Fig. 3.1). This distribution indicates that most respondents have a moderate attitude. When comparing the students' attitudes to the mean score, it reveals that more than half of the students fell into the below mean category (51.66%) than those in the above mean category (48.33%). This suggests that, on average, the participants tended to have a slightly less positive attitude towards e-learning than the mean score indicates.

Additionally, to understand if there is any difference between the attitude of two gender, i.e., boys and girls, we have calculated the Cohen's *d* value. The results inferred that the mean e-learning attitude score of girls was slightly higher than that of boys. The calculated effect size was (*d*) is -0.4, which indicates a small to moderate effect (Cohen's 1998 benchmarks), suggesting that gender has only a slight influence on e-learning attitudes among B.Sc. agricultural students. Since, the difference was quite small, this suggests that the students of both genders are largely on the same page with respect to their attitude towards e-learning. This may be due to better access to technology, having similar classroom experiences, equal access to smartphones, internet facilities and digital platforms especially in higher educational institutions, where e-learning has become an integral component of the curriculum (Moubayed *et al*., 2020; Subedi *et al*., 2020). Hence the opportunities for developing positive e-learning attitudes are almost identical.

Table 3.12. Distribution of the students based on attitude towards e- learning

| Category | Frequency | Percentage |
|---|---|---|
| Low | 21 | 17.5 |
| Medium | 81 | 67.5 |
| High | 18 | 15 |
| **Total** | **120** | **100** |
| Above mean (>233.383) | 58 | 48.33 |
| Below mean (<233.383) | 62 | 51.66 |
| **Total** | **120** | **100** |

**Fig. 3.1. Distribution of the respondents based on attitude towards e- learning**




### *Correlation between the factors affecting attitude of the students towards e-learning platforms and attitude level of the students*

Table 3.13. Correlation between the factors affecting attitude of the students towards e- learning platforms and attitude level of the students

| S.No. | Factors influencing the attitude | Correlation value |
|---|---|---|
| 1. | Father's education | 0.861** |
| 2. | Mother's education | 0.077* |
| 3. | Father's occupation | 0.130 |
| 4. | Annual income | 0.729* |
| 5. | Computer availability at home | 0.893** |
| 6. | Internet accessibility | 0.029* |
| 7. | Internet use experience | 0.722* |
| 8. | Computer availability at college | 0.962** |
| 9. | Time spent for internet | 0.621 |
| 10. | Internet use purpose | 0.940** |

*Significant at 0.05% **Significant at 0.01%

The correlation (0.861) indicates a positive relationship between fathers' education and attitude that implies

students with higher levels of father's education are more likely to show positive attitudes. The reason could be attributed to cognitive and social benefits associated with education. Higher education often equips individuals with critical thinking skills, exposure to diverse perspectives, and a broader understanding of the world, which may contribute to the adoption of positive attitudes. Mother's education and attitude have a 0.077 (Table 3.13) coefficient value which indicates that highly educated mothers value education more. As a result, their children may develop better attitudes toward learning. It may also be more helpful in encouraging their children to use e-learning resources and platforms. The positive correlation of 0.130 indicates a positive attitude of students toward e-learning platforms with respect to father's occupation. Higher occupational status of the father may denote a more technology literate, supportive home environment and more receptive to promoting e-learning platforms. A 0.792 strong positive correlation between annual income and attitude shows that higher levels of income may have more access to technology, internet access, and other resources to use, in order to engage with e-learning. Furthermore, it may represent a more favourable economic condition, and more inclination to pursue e-learning platforms and education professional development. Coefficient of 0.893 denotes that more access to a home computer is essential for promoting participation in e-learning platforms, which explains the strong correlation. People can access digital resources, engage in online learning, and acquire critical digital skills more easily and conveniently when they have a computer at home.

The weak positive correlation of 0.029 suggests that students who have internet resources at home tend to have a slightly more positive attitude. This may be because, at home they can easily find educational resources, tutorials, and extra materials. Additionally, get help from online tutors, join study groups, and take part in online discussions. The correlation value (r = 0.722) shows a strong positive connection between attitude toward e-learning and their experience with internet use, i.e., duration. This means, students with more time online have better perceptions of e-learning. Students with extensive internet use are likely to become more skilled in digital tools and at ease with online education platforms. But, factors like quality of training, access to the internet, and motivation to learn may also play a role in shaping these attitudes. Institutions should focus on students' existing internet experience to improve e-learning adoption and address gaps with focused digital skills training. The nearly perfect positive correlation of 0.962, highlights the important role of institutional support. Easy access to computers at college allows students to use e-learning platforms, engage them in online education, access digital resources, and build essential digital skills. This stresses how vital educational institutions are in offering the necessary technology to encourage positive attitudes towards e-learning. Correlation value 0.621 shows that students who spend more time on the internet usually have more positive views of e-learning. This result suggests that regular internet use may increase comfort with digital tools, leading to better e-learning acceptance. The high positive correlation (0.940) confirms a direct relationship between the significant role played by internet use in influencing people's perceptions towards e-learning. Greater use of the internet allows ease of use of e-learning platforms, enabling individuals to access online courses, digital tools, and collaborative learning environments.

## Adoption of various e- learning platforms by the students

***Relative advantage*** - Based on relative advantage of e-resources (Table 3.14), majority of students (56.67%) are into the category of high relative advantage. This suggests that the students perceive e-resources as having a high relative advantage over traditional resources. On the other hand, a smaller proportion student is into the low relative advantage (30.83%) and medium relative advantage (12.5%) categories. This indicates that a substantial portion of respondents views e-resources positively. The study also suggests that considering whether respondents scored above or below the mean of 19, reveals that 56.67% of the respondents fell into the above mean category, affirming a prevalent positive perception of relative advantage. In contrast, 43.33% of respondents fell into below the mean, indicating for improvement in convincing this subgroup with the advantages offered by e-resources.

Table 3.14. Distribution of respondents based on adoption of e-learning platforms

| **Distribution of respondents based on adoption of e-learning platforms** | | |
|---|---|---|
| **A. Relative Advantage (N=120)** | | |
| **Category** | **Frequency** | **Percentage** |
| Low (<19) | 37 | 30.83 |
| Medium (=19) | 15 | 12.5 |
| High (>19) | 68 | 56.67 |
| Above mean (>19) | 68 | 56.67 |
| Below mean (<19) | 52 | 43.33 |
| **B. Compatibility** | | |
| Low (<14) | 37 | 30.83 |
| Medium (=14) | 16 | 13.33 |
| High (>14) | 67 | 55.84 |
| Above mean (>14) | 67 | 55.84 |
| Below mean (<14) | 53 | 44.16 |
| **C. Ease of use** | | |
| Low (<15) | 50 | 41.67 |

| | | |
|---|---|---|
| Medium (=15) | 20 | 16.66 |
| High (>15) | 50 | 41.67 |
| Above mean (>15) | 50 | 41.67 |
| Below mean (<15) | 70 | 58.33 |
| **D. Demonstrability** | | |
| Low (<12) | 52 | 43.33 |
| Medium (=12) | 36 | 30 |
| High (>12) | 32 | 26.67 |
| Above mean (>12) | 32 | 26.67 |
| Below mean (<12) | 88 | 73.33 |
| **E. Visibility** | | |
| Low (<11) | 57 | 47.5 |
| Medium (=11) | 15 | 12.5 |
| High (>11) | 48 | 40 |
| Above mean (>11) | 48 | 40 |
| Below mean (<11) | 72 | 60 |

***Compatibility*** - Considering the compatibility of using the e-resources (Table 3.14), more than half of the students (55.84%) are into the high compatibility category, indicating that they perceive e-resources as being highly compatible with their needs or preferences. A smaller proportion of students are into the low compatibility (30.83%) and medium compatibility (13.33%) categories. It is evident from the results that the majority of students perceive e-resources as highly compatible with their existing practices, which is a positive sign for increased adoption. However, the presence of a substantial segment of respondents in the low category highlights the importance of addressing compatibility issues to enhance e-resource adoption comprehensively.

***Ease of use*** - According to the ease of use of e – learning resources (Table 3.14), majority (41.67%) fell into both high and low category indicating that a significant portion found the system challenging to use. A considerable number of students (16.66%) are into medium category suggesting that a moderate proportion of users found it moderately easy to use. This suggests that nearly half of the students find e-learning resources to be user-friendly and easy to navigate. This is a positive indicator of the overall user experience with e-learning platforms. However, 58.33 percent of students in below the mean category, indicates that there is a substantial portion of the students for whom ease of use is a concern.

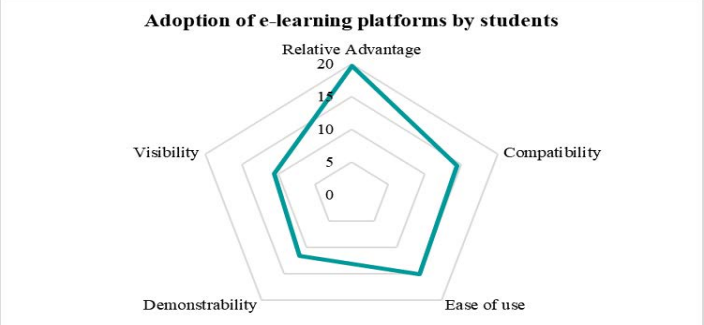



Fig. 2: Adoption of e-learning platforms by students

***Demonstrability*** - Based on demonstrability of e – learning resources, the data (Table 3.17) reveals that the majority of students belong to low category, followed by medium demonstrability category students (30%), while 26.67 percent had high demonstrability (Fig. 2) of e–learning resources. This suggests that a significant portion of the items have demonstrability scores below 12, indicating challenges in effectively demonstrating the e – learning resources. The study also indicates that 73.33 percent of students fell below the mean, indicating that a substantial majority encounters challenges in discerning and comprehending the advantages of e-learning. This underlines the pressing need for improved strategies in communicating and simplifying the concept. On the other hand, 26.67 percent in above the mean category, signifies the recognition and comprehension of the benefits of e-learning.

***Visibility*** - Considering the visibility of e- learning (Table 3.14), it is evident that the majority of students belong to low category, accounting for 47.5 percent, followed by the high category (40%), while the medium category represents the smallest portion (12.5%). This distribution indicates that a significant proportion of the students have low visibility. Moreover, 60 percent of students falling under below the mean category, indicates that a substantial majority finds e-learning resources less visible and accessible, underscoring the need for improved strategies to enhance their prominence and discoverability. On the other hand, 40 percent, represents a smaller yet notable segment that perceives e-learning resources as readily visible and accessible.

The Chi-square test of independence revealed no statistically significant association between gender and adoption level, where, $\chi^2$ (2, N = 120) = 0.708, and p = 0.702. The effect size, as measured by Cramér's V was 0.077. This indicates a negligible relationship, which suggests that both male and female students exhibited comparable levels of e-learning adoption, possibly due to equal exposure to digital learning tools, co-learning, institutional support and widespread technological accessibility (Pathak et al., 2019). The negative direction suggests that girls demonstrated slightly higher adoption levels compared to boys. Although the difference is not large, it suggests a modest gender-based variation in the use of e-learning tools between the two genders. This could be because female students often exhibit more consistent engagement with structured academic tasks, leading them to utilize course-mandated platforms more diligently. Furthermore, the communicative and collaborative nature of many e-learning tools may align more closely with peer interaction learning. This indicates that both the genders are proactively leveraging digital tools to support their academic success in their agricultural graduation courses (Chang et al., 2023; Mohammed et al., 2022).

## Conclusion

The present study concludes that, a significant portion of the students had parents with secondary-level education and secondary occupations, while a majority had annual family incomes exceeding one lakh /annum. Family size varied, with a slight majority having medium-sized families. Most of the undergraduate students had medium level of attitude towards E-Learning. Most of the students had access to essential technological tools like 4G mobile sets, personal laptops, and computers. Moreover, computer facilities were readily available at both home and college levels. A significant percentage of students also had internet access, with a preference for 1-5 hours of internet usage for academic purposes. The majority of students perceived high relative advantage and compatibility with e-learning. However, a significant portion found e-learning systems challenging to use (demonstrability and visibility), indicating that there may be for improvement in user-friendliness and accessibility. Overall, this study underscores the importance of considering socio-economic backgrounds and technological accessibility when implementing e-learning initiatives. While many students have embraced e-learning, there remains a need to address usability challenges to ensure a more inclusive and effective e-learning environment for all students.

**Declaration of competing interest** - The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

**Funding source** - Holy Mercy Divina Matla and Ashutosh Jena acknowledge the funding by Kerala Agricultural University-SRF-Fellowship, College of Agriculture, Vellayani, Thiruvananthapuram.

## References

Adewole-Odeshi, E. (2014). Attitude of students towards e-learning in south-west Nigerian universities: An application of technology acceptance model. *Library Philosophy and Practice (e-journal)*, *1035*(2014), 1–18.

Ahmadpour, A., Mirdamadi, S. M., & Soltani, S. (2016). Attitude towards on-the-job e-learning: The case of agricultural extension workers in Iran. *Journal of Agricultural Science and Technology*, *18*(1), 27–38.

Basumatary, P. (2018). *Attitude of senior secondary school students towards e-learning in Sikkim* (Doctoral dissertation).

Cakır, R., & Solak, E. (2015). Attitude of Turkish EFL learners towards e-learning through TAM model. *Procedia – Social and Behavioral Sciences*, *176*, 596–601.

Chang, J. H., Chiu, P. S., & Lai, C. F. (2023). Implementation and evaluation of cloud-based e-learning in agricultural course. *Interactive Learning Environments*, *31*(2), 908–923.

Dhamija, N. (2014). Attitude of undergraduate students towards the use of e-learning. *MIER Journal of Educational Studies, Trends and Practices*, *4*(1), 123–135.

Dhas, L. J. S. (2017). Attitude of college students towards e-learning. *International Journal for Research in Emerging Science and Technology*, *4*(9), 13–23.

Eze, S. C., Chinedu-Eze, V. C., Okike, C. K., & Bello, A. O. (2020). Factors influencing the use of e-learning facilities by students in a private higher education institution (HEI) in a developing economy. *Humanities and Social Sciences Communications*, *7*(1), 1–15.

Gupta, M., & Sharma, M. (2018). A study on attitude of senior secondary school students towards e-learning in relation to their gender, residential background, and nature of school. *International Journal of Engineering Science and Mathematics*, *7*(1), 418–432.

Hanif, A., Jamal, F. Q., & Imran, M. (2018). Extending the technology acceptance model for use of e-learning systems by digital learners. *IEEE Access*, *6*, 73395–73404.

Jyothi, V., & Vijayabhinandana, B. (2021). A scale to measure the attitude of students towards online learning. *Indian Research Journal of Extension Education*, *21*(2&3), 37–42.

Kamarulzaman, Y., Madun, A., & Ghani, F. A. (2011). Attitude towards e-learning among students: Evidence from a Malaysian public university. *British Journal of Arts and Social Sciences*, *3*(2), 132–142.

Kar, D., Saha, B., & Mondal, B. C. (2014). Attitude of university students towards e-learning in West Bengal. *American Journal of Educational Research*, *2*(8), 669–673.

Khan, N. (2017). An analysis of the attitude of engineering students towards e-learning in Bijnor. *International Journal of Creative Research Thoughts*, *5*(2), 1039–1046.

Matla, D., Jena, A., & Thomas, A. (2025). Investigating the attitude of agriculture students towards e-learning. *Indian Research Journal of Extension Education*, *25*(2&3), 156–167.

Mohammed, L. A., Aljaberi, M. A., Amidi, A., Abdulsalam, R., Lin, C. Y., Hamat, R. A., & Abdallah, A. M. (2022). Exploring factors affecting graduate students' satisfaction toward e-learning in the era of the COVID-19 crisis. *European Journal of Investigation in Health, Psychology and Education*, *12*(8), 1121–1142.

Moubayed, A., Injadat, M., Shami, A., & Lutfiyya, H. (2020). Student engagement level in an e-learning environment: Clustering using k-means. *American Journal of Distance Education*, *34*(2), 137–156.

Mutisya, D. N., & Makokha, G. L. (2016). Challenges affecting adoption of e-learning in public universities in Kenya. *E-Learning and Digital Media*, *13*(3–4), 140–157.

Ogunnowo, O. O. (2016). *Analysis of student attitudes towards e-learning: Case of computer science students in Nigeria* (Master's thesis, Eastern Mediterranean University).

Pathak, A., Makwana, K., & Sharma, P. (2019). A study on students' perception and attitude towards e-learning. *Journal of Gujarat Research Society*, *21*(16), 274–282.

Peyman, N., & Dehghani, M. (2014). On the investigation of efficacy of e-learning on higher education academic achievement. *Basic Research Journal of Education Research and Review*, *3*(4), 29–34.

Rajabalee, Y. B., & Santally, M. I. (2021). Learner satisfaction, engagement and performance in an online module: Implications for institutional e-learning policy. *Education and Information Technologies*, *26*(3), 2623–2656.

Ramírez-Correa, P. E., Arenas-Gaitán, J., & Rondán-Cataluña, F. J. (2015). Gender and acceptance of e-learning: A multi-group analysis based on a structural equation model among college students in Chile and Spain. *PLOS ONE*, *10*(10), e0138227.

Saba, T. (2012). Implications of e-learning systems and self-efficiency on students' outcomes: A model approach. *Human-Centric Computing and Information Sciences*, *2*(1), 1–11.

Sabah, N. M. (2013, September). Students' attitude and motivation towards e-learning. In *Proceedings of the First International Conference on Applied Sciences*, Gaza-Palestine, 24–26 September 2013 (ICAS-20).

Saroha, R. (2013). Attitude towards e-learning: A comparison of age groups. *International Journal of Information and Computation Technology*, *3*(7), 677–682.

Sewandono, R. E., Thoyib, A., Hadiwidjojo, D., & Rofiq, A. (2023). Performance expectancy of e-learning on higher institutions of education under uncertain conditions: Indonesia context. *Education and Information Technologies*, *28*(4), 4041–4068.

Shatnawi, S., Gaber, M. M., & Cocea, M. (2014). Automatic content-related feedback for MOOCs based on course domain ontology. In *Intelligent Data Engineering and Automated Learning – IDEAL 2014: 15th International Conference, Salamanca, Spain, September 10–12, 2014. Proceedings 15* (pp. 27–35). Springer International Publishing.

Suri, G., & Sharma, S. (2013). Impact of age on students' attitude towards e-learning. *Gian Jyoti e-Journal*, *3*(2), 73–80.

Subedi, S., Nayaju, S., Subedi, S., & Shah, S. K. (2020). Impact of e-learning during COVID-19 pandemic among nursing students and teachers of Nepal. *International Journal of Health Sciences Research*, *5*(3), 68–76.

Torun, E. D. (2020). Online distance learning in higher education: E-learning readiness as a predictor of academic achievement. *Open Praxis*, *12*(2), 191–208.

Unger, S., & Meiran, R. (2020). Students' attitudes towards online education during the COVID-19 viral outbreak of 2020: Distance learning in a time of social distance. *International Journal of Technology in Education and Science*, *4*(4), 256–266.