# Higher Education Students' Attitude Towards Web and Mobile Applications for Learning

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### Abstract

This paper presents findings from a study examining the perceptions of higher education students regarding the use of web and mobile tools for educational purposes. Mobile devices have become an essential component in several domains of human activities, including the field of education. Web and mobile platforms are very effective technologies that augment the educational experiences of students in higher education. Web tools such as Google Classroom, Kahoot, Edmodo, and Socrative are often used by students. Furthermore, students often use mobile applications such as Quizlet, TED, Skillshare, and Evernote to further their educational endeavours. Web and mobile platforms present an invaluable avenue for students to actively engage in classroom activities by means of real-time participation. These sophisticated tools provide educators with valuable insights into the learning progress and accomplishments of each individual student. In the realm of higher education, these digital solutions emerge as dynamic and efficacious resources, enabling adaptable and readily accessible learning experiences. They cultivate an ecosystem that promotes profound comprehension, nurtures constructivist ideologies, and attends to the personalized educational requirements. Against the backdrop presented, the primary objective of this scholarly research endeavour is to assess the perceptions held by students engaged in higher education with regards to the utilization of web and mobile tools for educational pursuits.

**Keywords:** Higher Education Students, Web applications, Mobile applications.

## **INTRODUCTION:**

In the current digital era, web and mobile learning have developed into effective tools for improving students' educational experiences (Al-Qaysi et al., 2020). These techniques meet the needs of contemporary learners by providing ease, flexibility, and interactive learning opportunities, ranging from collaborative online platforms to mobile access to educational resources. Students can use their smart phones or tablets for mobile learning to access instructional resources at any time and from any location. A vast array of interactive tools and multimedia information are also offered by web learning systems, which engage students and improve the learning experience (Samsujjaman and Halder, 2019). Web and mobile technologies are significant features of human life. The web and mobile applications have emerged as the recent trends in the 21<sup>st</sup> century education. Higher education students increasingly use social media and smartphone applications. These technologies provide flexible, personalised learning for students whenever and wherever they choose. In this particular context, the present study was conducted with the aim of determining the extent to which higher education students have favourable or unfavourable attitudes towards online and mobile learning applications.

The exponential growth and widespread adoption of mobile technology have instigated a transformative shift within the educational domain, thereby creating novel opportunities and approaches for the facilitation of pedagogical practices and knowledge acquisition (Vasiliki Matzavela and Efthimios Alepis, 2020). According to (Kumar and Goundar, 2022), examined there has been a notable upsurge in the advancement of mobile language learning applications, prompting numerous researchers to investigate their effectiveness and potential advantages. This observation is suggestive of a more extensive pattern within the domain of mobile learning (m-learning), as educators and institutions on a global scale are increasingly adopting mobile devices due to their inherent convenience and adaptability.

The inherent capacity of mobile learning (m-learning) extends beyond the confines of language acquisition, encompassing a broader spectrum of educational domains. (Evans, 2008) conducted an in-depth investigation into the efficacy of mobile learning (m-learning) through the utilisation of podcast revision lectures in the context of higher education. The research scholar's findings underscore the potential of harnessing mobile learning tools as a supplementary means of enhancing conventional educational methodologies. This approach offers students a wide array of learning resources that are tailored to their individualised requirements and personal inclinations. In a congruent manner, Oliveira, Pedro, and Santos (2021) undertook a comparative pilot investigation, elucidating the cognitive constructs of students' perceptions and empirical utilisation of mobile applications within the context of higher education. The present study highlights the utmost significance of comprehending the disparity that exists between perception and reality in the context of incorporating mobile applications into pedagogical methodologies. Moreover, the assimilation of social media within the educational domain has incited scholars to delve into its ramifications on student dispositions and accomplishments.

(Nachimuthu, 2013: Samsujjaman, 2019) have extensively examined the attitudes of student teachers towards social media, shedding light on the complex and varied perspectives regarding its utilisation within academic environments. (Ahmad, 2020) The aforementioned studies underscore the imperative of attaining equilibrium in harnessing the advantages of social media platforms while concurrently ameliorating potential detractions or adverse consequences on scholastic achievement.

The researcher (Kirkwood, 2018) examined a comprehensive and in-depth analysis of the contemporary landscape of mobile learning. The author highlights the multifaceted nature of this field, shedding light on the various approaches and methodologies that are being actively investigated and implemented on a global scale. The manifestation of this phenomenon is particularly conspicuous in heterogeneous geographical contexts, such as the Caribbean region, where scholarly investigations have been undertaken to examine the utilisation patterns of mobile technology within the realm of tertiary education institutions (PSU Research Review, 2020). These studies offer invaluable insights into the global ramifications of mobile learning (m-learning) and the potential challenges and benefit it presents in diverse cultural and institutional settings.

The paramount significance lies in guaranteeing the efficacy and usability of mobile learning tools. (Kumar and Mohite, 2016) conducted an in-depth investigation into the aforementioned subject matter, providing valuable empirical insights and offering comprehensive guidelines pertaining to the usability of mobile learning applications. The research conducted by the authors emphasizes the imperative nature of developing user-centric and intuitively designed applications in order to optimize the advantages of mobile learning (m-learning).

## **REVIEW OF RELATED LITERATURE**

(Almuhaissen et.al, 2023) investigated the role of mobile learning (m-learning) in the context of medical education in Jordan. Their primary focus was on understanding medical students' attitudes towards m-learning in comparison to traditional face-to-face methods. Using a quantitative approach, they surveyed 690 students from the University of Jordan's medical schools. Findings revealed that while students use smartphones for learning, most still prefer traditional methods. The research highlights variations in m-learning preferences based on teaching styles and content types. Unlike previous studies that focused on technology acceptance models, this study distinctively delves into medical students' specific attitudes. The insights gained are crucial for guiding Jordan's future medical education strategies, emphasizing the potential integration of m-learning. (David Manuel et al., 2021) performed a pilot research at the University of Aveiro to examine how higher education students utilize mobile apps in class. Grounded Theory was used to analyse university access point data logs with 77 Communication and Arts Department participants. Initial findings showed that theoretical courses used mobile applications, particularly Facebook and Instagram. In these sessions, students used apps 11,177 times on average. Interestingly, pupils said app use in class was distracting. Students' app use perception differed from their real heavy use.

(Aremu & Adeoluwa, 2022) examined the students' m-learning attitudes and academic performance during the COVID-19 epidemic. The College of Education, Ikere Ekiti, Nigeria, gathered data from 50 students using a preand post-test experimental method. A student attitude questionnaire and academic performance exam were used. Initially, views towards m-learning were not significantly different from conventional learning, but post-test findings revealed a substantial change in favour of m-learning (p<0.005). Most students possessed learning-friendly mobile devices and the Zoom app, according to demographic statistics. The findings support m-learning in the curriculum.

Mâță et al. (2021) examined higher education students' views on mobile technology (MT) usage while studying. Data was collected from 575 northeastern Romanian university students using the Mobile Technologies Questionnaire (MTQ). The MTQ found two main factors: study resources and communication and learning. Despite substantial variations in views depending on age, year of study, location, academic rank, and study programme, the impact sizes were minimal to modest. This study supports the MTQ as a brief instrument to assess higher education students' MT views.

In their study, Bimal Aklesh Kumar and Munil Shiva Goundar (2022) conducted a comprehensive analysis of existing literature pertaining to the advancement of Mobile language learning (MLL) apps. The objective of this research was to collect and analyse information from a selection of 47 papers sourced from seven digital libraries. The focus of the study was to consolidate knowledge and understanding on requirements collecting, design approaches, and assessment strategies. The results of the study revealed that the primary sources of requirements were derived from extensive literature research and in-depth interviews. Application development often utilises app development technology, speech integration, and gamification techniques. The predominant assessment methodology used in this study was usability testing. The paper proposes more investigation to strengthen the resilience of the MLL domain.

### INSIGHTS DRAWN FROM THE STUDY

The studies indicate that higher education students like online and mobile learning apps. (Batmetan, 2018) indicated that most higher education students use mobile learning and plan to continue. Students prefer mobile devices versus desktop PCs for internet access and study, according to (Wong, 2015). (Wai, 2018) found that undergraduates utilize mobile applications for communication, academic materials, and collaboration. (Kumar, 2020) found that Malaysian Information Technology undergraduates like utilizing mobile technology for teaching and learning, with WhatsApp being the most popular app for communication and exchanging learning information.

### **OBJECTIVES OF THE STUDY**

The objectives of the present study are:

- > To find out the students' attitude towards web and mobile applications in higher education.
- > To find out the significance of difference, if any in students' attitude towards web and mobile applications use in higher education with respect to their gender, discipline of study, place of stay and locality of the institution.

## HYPOTHESES OF THE STUDY

In line with the above objectives, the following hypotheses were formulated:

- The Higher Education Students of Pudukkottai District do not use web and mobile applications for their learning.
- There is no significant difference between the mean web and mobile applications attitude scores of the Male and Female Higher Education Students of Pudukkottai District
- There is no significant difference between the mean web and mobile applications attitude scores of the Arts and Science Higher Education Students of Pudukkottai District.
- There is no significant difference between the mean web and mobile applications attitude scores of the Hosteller and Day scholar Higher Education Students of Pudukkottai District.
- There is no significant difference between the mean web and mobile applications attitude scores of the Rural and Urban Higher Education Students of Pudukkottai District.

## **RESEARCH METHODOLOGY:**

**Sample:** The investigator selected as many as 310 under graduate Arts & Science students simple random sampling technique as samples. The investigator developed the tool "Students Attitude towards Web and Mobile Applications in the Higher Education" based on like web, Zoom, Google meet, Facebook, WhatApps, Snapchat, Instagram, Google Maps, YouTube, Skype, SkyDrive, Evernote, DropBox and Google Apps.

### **COLLECTION OF DATA**

The investigator visited the College of Arts and Science for data collection. Prior permission was obtained from the Principals of the college of arts and sciences for the administration of the instrument. The researcher explained the purpose and purpose of the study before providing the tool to college students. Students responded independently to each object of the tool Since the instrument was administered directly by the inspector, it was confirmed that the sample responded to all the objects in the instrument.

## ANALYSIS OF DATA

After collecting the data from the respondents, their responses were tabulated. The scores were also given to each and every statement of the attitude scale and these score were used for the statistical analyses. The collected data were analyzed by using appropriate statistical techniques such as Mean, Standard Deviation, t-test.

## ANALYSIS OF WEB AND MOBILE APPLICATIONS ATTITUDE SCORES

### INFERENTIAL ANALYSIS

For the present study, the investigator used t-test to make inferences about the sample. For a better understanding, the following tables are presented and discussed as follows.

### Null Hypothesis: 1(H<sub>0</sub>1)

There is no significant difference between the mean web and mobile applications attitude scores of higher education students of pudukkottai district, sub-grouped on the basis of them Gender.

In order to find out whether there is a significance of difference between the mean web and mobile applications attitude scores of male and female higher education students of pudukkottai district, the above Null hypothesis was formulated, the t-test was attempted to test the same.

Table No 1

Gender	Ν	Mean	S.D	't' value
Male	118	15.45	4.14	- 4.43*
Female	192	17.81	5.12	

Mean Standard Deviation and t- value of Web and Mobile Applications Attitude Scores of Male and Female
Higher Education Students Pudukkottai District

\*Significant at 0.05 level

Table 1 presents a comparative analysis of the attitudes towards online and mobile apps for learning among male and female higher education students in Pudukkottai district. The average attitude score for male students is 15.45, with a standard deviation of 4.14. On the other hand, female students have an average attitude score of 17.81, with a standard deviation of 5.12. The calculated t value of 4.43 exceeds the critical value of 1.97 at a significance level of 0.05. This finding suggests a notable disparity in the perspectives on these technologies among male and female pupils. As a result, the the null hypothesis positing the absence of discernible variations in views across genders has been refuted. The results indicates that female students have a more positive disposition towards using online and mobile apps for educational purposes in comparison to their male counterparts.

## Null Hypothesis: 2 (H<sub>0</sub>2)

There is no significant difference between the mean Web and mobile applications attitude scores of arts and science higher education students of pudukkottai district.

In order to find out whether there is a significant difference between the mean web and mobile applications attitude scores of arts and science higher education students of pudukkottai district, the above null hypothesis was formulated and the t-test was attempted to test the same.

 Table No 2

 Mean Standard Deviation and t- value of Web and Mobile Applications Attitude Scores of Male and Female

 Higher Education Students Pudukkottai District

Discipline of Study	Ν	Mean	S.D	't'value
Arts	108	15.64	4.43	
Science	202	17.59	5.01	3.51*

\*Significant at 0.05 level

The table above (2) highlights a comprehensive analysis of the Attitude Score towards Web and Mobile Applications among students pursuing higher education in the fields of arts and science in the district of Pudukkottai. These students were carefully selected to form the sample for this study. The average attitude score for web and mobile applications among students in the arts discipline is recorded as 15.64, while students in the science discipline exhibit an average score of 17.59. These scores are accompanied by standard deviations of 4.43 and 5.01, respectively.

The estimated value of `t`, which is 3.51, exceeds the critical value of 1.97 at a significance level of 0.05, indicating statistical significance. The findings suggest that there are significant differences in the attitudes towards online and mobile apps between male and female higher education students. Therefore, the null hypothesis, which states that there is no statistically significant difference in the mean attitude scores of arts and science higher education students towards web and mobile apps, is rejected. Moreover, it is evident that the average attitude score towards online and

mobile apps among students in the arts discipline is lower compared to that of students in the scientific field. Hence, it may be inferred that scientific students have a superior disposition towards the utilisation of online and mobile apps for educational purposes, as compared to their peers.

#### Null Hypothesis: 3 (H<sub>0</sub>3)

There is no significant difference between the mean Web and mobile applications attitude scores of hosteller and day-scholar higher education students of pudukkottai district.

In order to find out whether there is a significant difference between the mean Web and mobile applications attitude scores of Hosteller and Day-Scholar higher education students, the above null hypothesis was formulated and the t-test was attempted to test the same.

#### Table No 3

## Mean Standard Deviation and t- value of Web and Mobile Applications Attitude Scores of Male and Female Higher Education Students Pudukkottai District

Type of Student	Ν	Mean	S.D	't'value
Hosteller	81	18.74	5.65	2 36*
Day-Scholar	229	16.27	4.44	5.50*

\*Significant at 0.05 level

The table provided (Table 3) displays an examination of the attitude scores towards online and mobile apps among higher education students, namely those residing in hostels and those who commute on a daily basis. These students were selected as the sample for the study. The average attitude ratings for online and mobile apps for hosteller students is 18.74, while for day scholar students it is 16.27. The corresponding standard deviations are 5.65 and 4.44, respectively.

The estimated t-value of 3.36 exceeds the critical value of 1.97 at a significance level of 0.05, indicating statistical significance. The findings suggest that there are notable differences in the attitudes towards online and mobile apps between higher education students who reside in hostels and those who commute on a daily basis. Therefore, the null hypothesis, which states that there is no statistically significant difference in the mean attitude scores towards web and mobile apps technologies among higher education students residing in hostels and day-scholars in the Pudukkottai area, is rejected. Moreover, it is evident that the average Attitude Score for online and mobile apps among hosteller students surpasses that of the Day-scholar students. Hence, it can be inferred that students residing in hostels exhibit a more favourable disposition towards using online and mobile apps for educational purposes compared to their non-hosteller counterparts.

### Null Hypothesis: 4 (H<sub>0</sub>4)

There is no significant difference between the mean Web and mobile applications Technologies Attitude Scores of rural and urban higher education students of pudukkottai district.

In order to find out whether there is a significant difference between the mean web and mobile applications attitude scores of rural and urban higher education students of pudukkottai district, the above null hypothesis was formulated and the t-test was attempted to test the same.

Table No 4
Mean Standard Deviation and t- value of Web and Mobile Applications Attitude Scores of Male and Female
Higher Education Students Pudukkottai District

Locality of the Institution	Ν	Mean	S.D	't' value
Rural	120	16.00	4.82	2.64*
Urban	190	17.49	4.87	

\*Significant at 0.05 level

The table (4) shown above displays an examination of the attitude scores towards online and mobile apps among higher education students in the rural and urban areas of Pudukkottai district. These students were selected as the sample for the study. The average attitude score for online and mobile apps among rural students is 16.00, whereas urban students have an average score of 17.49. The standard deviations for these scores are 4.82 and 4.87, respectively.

The computed `t` value, 2.64, exceeds the critical threshold of 1.97 at a significance level of 0.05. The findings suggest that there are notable differences in the attitudes towards online and mobile apps between higher education students in rural and urban areas of Pudukkottai district. Therefore, the null hypothesis, which states that there is no statistically significant difference in the mean attitude towards web and mobile apps among higher education students in rural and urban areas of Pudukkottai district, is rejected. Moreover, it is evident that the average attitude score towards online and mobile apps among rural students is lower compared to urban students. Hence, it may be inferred that urban students exhibit a more favourable disposition towards the use of online and mobile apps for educational purposes, as compared to their rural counterparts.

### The implication for this study

- > In light of the prevailing inclination towards mobile apps owing to their enhanced accessibility and adaptability, educational institutions have to contemplate the incorporation of a greater number of mobile-responsive resources and platforms within their curriculum.
- It is recommended that educators be provided with training sessions to ensure they possess the necessary skills and expertise to proficiently use online and mobile apps into their instructional practices.
- It is suggested that educational institutions consider implementing rules or best practises aimed at reducing distractions that may arise from the use of mobile devices for academic purposes. This may include suggestions for applications that restrict access to certain functionality or alerts during periods of study.
- It is essential for institutions and app developers to give utmost importance to enhancing data security procedures. It is important to effectively convey precise information about the use and storage of data to students in order to ensure transparency.
- The balanced learning approach is a pedagogical strategy that aims to provide a well-rounded education by incorporating various teaching methods and approaches.
- In the process of incorporating digital technologies into educational practises, it is essential to strike a harmonious equilibrium with conventional teaching methodologies in order to safeguard the development of students' critical thinking and problem-solving abilities.

- It is essential for developers to proactively solicit input from students in order to consistently enhance the functions of educational apps, therefore aligning them with educational objectives and meeting the demands of students.
- Digital literacy programmes refer to educational initiatives that aim to enhance individuals' knowledge and skills in using digital technologies effectively. These programmes are designed to provide participants with the necessary competencies.
- In order to optimize the advantages derived from these technologies, educational institutions should implement digital literacy initiatives aimed at assisting students in effectively and securely navigating, evaluating, and using digital material.
- ➢ It is essential to guarantee the accessibility of online and mobile apps for students with impairments. It is important for applications to adhere to established accessibility standards and rules.
- It is important for institutions to regularly evaluate the efficacy of the online and mobile apps they support or use, in order to ascertain their continued relevance and value in facilitating students' educational progress.
- Educational institutions have the potential to establish collaborations with application developers in order to generate customized solutions that effectively cater to the unique requirements of their student body.

## **DELIMITATION OF THE STUDY**

- ✓ The study has been conducted only on a sample of higher education students from Arts and Science students.
- ✓ Due to time constraints, the sample was limited only to 310 students and the study is limited only to a few select demographic variables like gender, the discipline of study, place of stay and locality of the institution.

### **CONCLUSIONS:**

The aforementioned study highlights the pivotal role that web and mobile applications play in augmenting the overall educational experiences within higher education settings. The prevailing consensus among the student populace suggests that the utilisation of digital tools has yielded favourable outcomes in their pursuit of advanced academic endeavours. Numerous individuals hold the belief that their scholarly advancement would be impeded in the absence of such invaluable resources. Presently, a multitude of students pursuing higher education heavily depend on these digital platforms to engage in a diverse array of activities, encompassing independent study, collaborative discourse, virtual lectures, assessments, video-based meetings, web-based seminars, data collection endeavours, and even remote oral examinations (commonly referred to as VIVA-VOCE).

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