M-Learning Applications And Rural Indian Users: The Impact Of Demographic And Non-Demographic Variables On Their Awareness And Usage

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Abstract: As smartphone-based digital technology progresses, Mobile Learning (M-learning) continues to advance, making education more accessible, engaging, cost-effective, entertaining, and immersive. Smartphones have increasingly supplanted traditional textbooks and slow-paced learning systems, emerging as significant alternatives for education. This research investigates the awareness of M-learning apps among rural populations and examines the impact of various demographic and non-demographic factors on the usage of these apps. The study collected primary data from a sample of 426 respondents and employed the ANOVA test for data analysis. Findings reveal that awareness of M-learning apps is widespread, and both demographic and non-demographic factors significantly influence their usage. The surge in M-learning apps, particularly during the pandemic, has facilitated easier access to a diverse range of online courses and knowledge globally, thereby simplifying learning for everyone.

Introduction

Today mobile phones are used for multiple purposes like social networking and communication, online shopping, playing games, ordering food, etc. Nowadays, mobile phones are used to access learning also. Mobile devices and technologies are innovative and important to the field of graduate education. 'Mobile Learning' is a novel channel to gain access to learning resources 'whenever and whatever is wanted'. Mobile Learning is popularly called M–Learning in which portable devices capable of displaying digital content such as smartphones, feature phones, tablet PCs, and MP3 audio devices are used to access learning. M–Learning provides tailored learning content. The major advantage of M-learning is that it is cost-effective as it is cheaper than Books, CDs, DVDs, etc. To define the Mobile Learning process E-learning is a wider term.

Mobile Learning can be viewed as E-learning's next generation evolution.

M – Learning is increasing in the technology world but COVID-19 resulted in an exponential increase in its adoption. Rural people's use of mobile phones for learning can be an indicator of flexible learning. M–learning includes E–Books, Educational Videos, or learning activities. Due to Mobile devices, students can study anywhere and anytime irrespective of location and time zones. It provides the learner with self-direction and personalised learning. It makes the learning interactive. Online learning now has become a significant educational practice for students as well as for teachers. Mobile phones and smartphones are teaching tools to spread knowledge quickly and make learning accessible. Students and teachers are increasingly using mobile devices for learning. Though M-learning is gaining popularity,

especially after COVID-19 it cannot replace existing learning methods.

Various areas of education are covered by mobile learning. It offers various online courses and improves the uptake of learning. Various mobile learning apps are there and different in their uses. There are multiple M–learning apps have been developed by public stakeholders such as government ministries like Diksha App, E-Pathshala App, Swayam App, IGNOU Student App, NIOS App, etc. People use various apps at their convenience for learning.

Literature Review

In Krull et al.'s (2017) study on the contemporary trends with respect to M-learning in the higher educational systems a number of issues significant to users' M-learning were found. The study surveyed 233 respondents during 2011 to 2015 and reported multiple user trends, types of applications, usage methods, and systems governing utilization of M-learning in real practice. Joan (2013), in a research study on the use of M-Learning as a distinct learning modality for contemporary research, found that students and teachers who use mobile devices are better than others when it comes to style of mobile learning and academic achievement and mobile learning were positively correlated. This study has concluded that mobile phones were increasing the inventory of learning and learning paradigms. The "Mobile Learning" study was carried out by Ganesan and Raja (2019) to present the current state of mobile learning merits, characteristics, and challenges to sustaining learning and to describe various mobile apps.

The research was carried out by Demir and Akpinar (2018) on "The effect of mobile learning applications on students' academic achievement and attitudes toward mobile learning"; this research was done on student respondents from the Faculty of Education of Turkey's Dokuz Eylul University. The attitude indicator with respect to M-Learning was measured using prior validated attitude scales. The study found that mobile learning increased their motivation and created a positive impact on their academic performance.

Mobile applications are developed for various learning activities and work on smartphones and tablets but not necessarily on laptops or desktops.

However, there is a dearth of studies researching awareness and use with respect to new mobile ICTs such as mobile learning apps in the rural Indian context.

Research Methodology
Objectives

- To study the awareness of M-learning Apps.
- To study factors influencing M-learning Apps' use.

As this study does not aim to establish causation between various indicators and dependent variables the study design is descriptive and not confirmatory. The convenience sampling method and snowballing techniques were used to obtain the sample. Primary data on the awareness and use indicators for M-learning apps namely Diksha app, E-Pathshala app, Swayam app, IGNOU Student App, NIOS app was gathered through a survey employing structured questionnaires sent to respondents as links to Google Forms. 426 responses were received. Secondary data was collected from articles, journals, magazines, newspapers, and theses. ANOVA test was used for the detailed analysis of data and the tests of statistical significance between various independent and dependent variables.

Hypotheses

H1: There is no Awareness of various M-learning Apps

H2: There is no significant influence of Gender on the use of M-learning apps.

H3: There is no significant influence of Age on the use of M-learning Apps.

H4: There is no significant influence of Area of Living on the use of M learning Apps.

H5: There is no significant influence of Monthly Income on the use of M learning Apps.

H6: There is no significant influence of monthly Expenses on the use of M-learning Apps.

H7: There is no significant influence of Mobile Phone Count on the use of M-learning Apps.

H8: There is no significant influence of Attitude on the use of M-learning Apps.

H9: There is no significant influence of Experience on the use of M-learning Apps.

Limitations:

- The size of the study sample is relatively limited and the data was collected from rural respondents only.
- Primary data was collected which could be biased.
- The study period is limited to 4 weeks only.
- Respondents are primarily students.
- Due to the aforementioned limitations, the generalizability of the findings of this study, as applicable to the population of

interest, is not possible. However, the extant research literature in this area of inquiry shows that it is common for studies to use cross-sectional designs with student samples (Ahmed et al., 2023; Yalchinka and Yucel, 2023; Zhao et al., 2018); therefore, it can be argued that the study's objectives and findings remain significant despite these limitations.

Scope and application: This study would be useful to the academicians and research scholars in further research. This research would be useful to the government to analyze how aware rural people are of various M-learning apps so that the government could plan an awareness campaign for its M-learning apps and other online course providers also plan their awareness strategy to make people aware of their M-learning apps.

Data Analysis and Interpretation:

H_0: **People are not aware of various M-Learning Apps**

H_1: **People are aware of various M - Learning Apps.**

Table 1

'ANOVA'						
		Sum of Squares	Df	Mean Square	F	Sig.
Awareness of M – Learning Apps* People	Between Groups	0.0149	1	0.0149	3.170	0.0340
	Within Groups	13.44	425	0.032		
	Total	13.4549	426			

As reflected in Table no. 1 the p-value is 0.0340 that is lower than the significance level 0.05 so the null hypothesis 'People are not aware of various M -Learning Apps' is rejected. Therefore, people are aware of various M - Learning Apps.

H0: There is no significant influence of Gender on the use of M-learning apps.

H2: There is a significant influence of Gender on the use of M-learning apps.

Table 2

'ANOVA'						
		Sum of Squares	Df	Mean Square	F	Sig.
Use of M – Learning Apps*Gender	Between Groups	0.016	1	0.016	2.470	0.0171
	Within Groups	11.60	425	0.027		
	Total	11.616	426			

As reflected in Table no. 2 the p-value is 0.0171 that is lower that the significance level 0.05, thus the null hypothesis 'There is no significant influence of Gender on use of M – Learning apps' is rejected. Therefore, it can be inferred that Gender has a statistically

significant influence on the dependent measure M – Learning App use.

H_0: There is no significant influence of Age on the use of M learning Apps.

H_3: There is a significant influence of Age on the use of M – Learning Apps.

Table 3

'ANOVA'						
		Sum of Squares	Df	MeanSquare	F	Sig.
Use of M – Learning Apps*Age	Between Groups	0.0131	1	0.0131	2.405	0.0190
	Within Groups	10.49	425	0.0247		
	Total	10.5031	426			

As reflected in Table no. 3, the p-value is 0.0190 that is below the significance level of 0.05 and thus the null hypothesis 'There is no significant influence of Age on the use of M – Learning apps' is rejected. Therefore, it can be

inferred that Age has a statistically significant influence on M – Learning App use.

H0: There is no significant influence of Area of living on the Use of M learning Apps.

H4: There is a significant influence of Area of living on the use of M – Learning Apps.

Table 4

'ANOVA'						
		Sum of Squares	Df	MeanSquare	F	Sig.
Use of M – Learning Apps*Area of Living	Between Groups	0.01	1	0.019	2.498	0.018
	Within Groups	10.66	425	0.02509		
	Total	10.679	425			

As reflected in Table 4, the p-value is 0.018 that is below the significance level of 0.05 and thus the null hypothesis 'There is no significant influence of Area of living on the use of M – Learning apps' is rejected. Therefore, Area of Living has a statistically significant influence on M-Learning app use.

H0: There is no significant influence of Monthly Income on the use of M learning Apps.

H5: There is a significant influence of Monthly Income on the use of M – Learning Apps.

Table 5

'ANOVA'						
		Sum of Squares	Df	MeanSquare	F	Sig.
Use of M – Learning Apps*Monthly Income	Between Groups	0.0141	1	0.0141	2.511	0.020
	Within Groups	11.06	425	0.0260		
	Total	10.0741	426			

Table 5 reflects the p-value 0.020 that is lower in relation to the significance level 0.05 so the null hypothesis 'There is no significant influence of Monthly Income on use of M – Learning Apps' is rejected. Therefore, it can be inferred that the variable Monthly Income has a statistically significant influence on the dependent measure M-Learning app use.

H0: There is no significant influence of monthly expenses on the use of M-learning apps.

H6: There is a significant influence of Monthly Expenses on the use of M – Learning apps.

Table 6

'ANOVA'						
		Sum of Squares	Df	MeanSquare	F	Sig.
Use of M – Learning Apps*Monthly Expenses	Between Groups	0.0162	1	0.0162	2.481	0.0241
	Within Groups	11.17	425	0.02628		
	Total	11.1862	426			

The p-value reflected in table no. 6 is 0.0241 and since this value is below the significant value of 0.05 the null hypothesis 'There is no significant influence of Monthly Expenses on the use of M – Learning apps' is rejected. Therefore, it can be inferred that the variable Monthly Expenses has a statistically significant influence on M – Learning App use.

H0: There is no significant influence of Mobile Phone Count on use of M-learning apps.

H7: There is a significant influence of Mobile Phone Count on the use of M – Learning apps.

Table 7

'ANOVA'						
		Sum of Squares	Df	MeanSquare	F	Sig.
Use of M – Learning Apps *Mobile Phone Count	Between Groups	0.0201	1	0.0201	2.389	0.0263
	Within Groups	11.71	425	0.02755		
	Total	11.7301	426			

The p-value specified in the above ANOVA tabulation is 0.0263 which is below the significance level of 0.05 so the null hypothesis 'There is no significant influence of Mobile Phone Count on use of M – Learning Apps' is rejected. Therefore, it can be inferred that the variable Mobile Phone Count has a statistically significant influence on the dependent measure M – Learning Apps use.

H0: There is no significant influence of Attitude on the use M-learning Apps.

H8: There is a significant influence of Attitude on the use of M–learning Apps.

Table 8

'ANOVA'						
		Sum of Squares	Df	MeanSquare	F	Sig.
Use of M – Learning Apps *Attitude	Between Groups	0.0220	1	0.0220	2.610	0.0285
	Within Groups	11.86	425	0.0291		
	Total	11.882	426			

As reflected in table no. 8, the p-value 0.0285 is below the significance level 0.05 so the null hypothesis 'There is no significant influence of Attitude on the use of M – Learning Apps' is rejected. Therefore, it can be inferred that the variable 'Attitude' has a statistically

significant influence on the dependent variable M-Learning app use.

H0: There is no significant influence of Experience on the use M– Learning apps.

H9: There is a significant influence of Experience on the use M– Learning apps.

Table 9

'ANOVA'						
		Sum of Squares	Df	MeanSquare	F	Sig.
Use of M – Learning Apps* Experience	Between Groups	0.025	1	0.025	2.661	0.0215
	Within Groups	10.42	425	0.0452		
	Total	10.445	426			

As seen in Table 9 the p-value is 0.0215 so the null hypothesis 'There is no significant influence of Experience on the use of M – Learning Apps' is rejected. Therefore, it can be inferred that the variable 'Experience' has a statistically significant influence as far as the use of M – Learning Apps is considered.

Discussion and Conclusion

This quantitative research collected a dataset on the awareness of apps for mobile learning among the rural people and statistically analysed the effect of various demographic and non-demographic factors on the use of a selected set of these apps. The findings herein confirm statistically significant levels of awareness of a number of mobile learning applications amongst the group that was studied. Demographic factors like Gender, Age, and Area of living can explain the uptake and use of M-learning apps. Other factors like Monthly Income, Monthly Expenses, Mobile Phone Count, Attitude, and Experience influence the outcome measure i.e. m-learning application use at a statistically significant level.

This research study has contributed to the emerging research area of mobile learning in rural regions and its findings can be compared and contrasted with other widely cited studies. Compared to the findings of Mutambara and Bayaga (2020) as well as Mutambara and Bayaga (2021), who reported the significant effects of psychometric (non-demographic) indicators on rural students' acceptance of the M-learning apps, this research study has found demographic indicators to also have a statistically significant effect on uptake by student users in rural regions. It aligns with some of the findings of Kumar et al. (2010) who found Gender to be a definite factor for the uptake of mobile learning among Indian rural children, outside of school, based on a 26-week study.

Another notable study by Chatterjee et al. (2020) - who found that the price value of m-learning also plays a role in determining the adoption of this technology, along with psychometric variables, by girl students in a rural Indian school - whilst acknowledging that other predictors needed to be included to improve the research model for mobile learning acceptance did not consider demographic elements in their research. Compared to the sample size of 271 rural girl students, the research study reported herein has a greater sample size as well as heterogeneity in the sample.

Other well cited studies such as Nestel et al. (2010) and Nestel et al. (2014), which found technological causes such as the device available, infrastructure, IT-support and user attributes to be the precursors to the use of mobile learning by students of a village medical school reported not testing the relationship of demographic elements such as respondents' age and sex with mobile learning. This study has thus taken further the research agenda suggested by such earlier research in

testing the relationships between demographic elements and M-learning.

Previous studies from Southeast Asia such as Wongkhamdi et al. (2017) found appropriateness to user lifestyle and convenience of use to be promoting readiness for the acceptance of mobile learning in rural Thailand. Compared to such research, this study has examined a research model with both demographic and non-demographic elements and it can be argued that both sets of factors are likely to be instrumental in the development of mobile learning readiness in rural settings.

Prior research from rural European contexts such as Gheorghiu and Ştefan (2016), which found teacher and student psychology to be a greater concern when it comes to mobile learning, this study's findings highlight the significance of demographic elements to the variation in adoption of M-learning apps' and it can be argued that testing the relationship of demographic or socioeconomic elements to mobile learning is significant in a developing country context such as rural India.

In today's technological era people are becoming more tech-savvy; they are using various devices for personal development. Various mobile devices are used for M-learning and multiple M – learning apps are developed to provide online courses and knowledge. M-learning was gaining popularity for the last two decades but it got impetus during the pandemic in 2020 and 2021. During this period a large number of M -Learning apps were developed for online learning. In this study, it was found that Demographic factors and other factors significantly impact the utilization of these apps by rural Indian user groups. M-learning is the best way to provide distance education and online education due to its easy accessibility, cost-effectiveness, and more engaging but it needs expertise and could also distract the users. M-learning can gain popularity among students as it provides immersive learning. Thus, the M-

learning apps are coming up as an alternative to the textbooks steadily. All these trends indicate that the scope of these applications for learning is likely to be much wider in the coming future.

References

Ahmed S A M, Suliman M A E, Al-Qadri A H, & Zhang W (2023). Exploring the intention to use mobile learning applications among international students for Chinese language learning during the COVID-19 pandemic. *Journal of Applied Research in Higher Education*, *ahead-of-print*(ahead-of-print).

Chatterjee S, Majumdar D, Misra S, & Damaševičius R (2020). Adoption of mobile applications for teaching-learning process in rural girls' schools in India: an empirical study. *Education and Information Technologies*, *25*(5), 4057-4076

Demir K & Akpinar E (2018). The Effect of Mobile Learning Applications on Students' Academic Achievement and Attitudes toward Mobile Learning. *Malaysian Online Journal of Educational Technology*, *6*(2), 48-59.

Ganesan P K, & Raja V (2019). Mobile Learning. In *Digital Education* (1 ed., pp. 97-105). APH Publishing Corporation.

Gheorghiu D, & Ştefan L (2016). Mobile-Learning in a rural community. Problems of the psychology of learning in context at primary and secondary school students. *Bulletin of the Transilvania University of Braşov, Series VII: Social Sciences and Law*, *9*(2), 73-84.

Joan D R R (2013). A Study on Mobile Learning as a Learning Style in Modern Research Practice. *i-*

manager's Journal on School Educational Technology, *8*(4), 29-37.

Krull G, & Duart J M (2017). Research Trends in Mobile Learning in Higher Education: A Systematic Review of Articles (2011 – 2015). *International Review of Research in Open and Distributed Learning*, *18*(7).

Kumar A, Tewari A, Shroff G, Chittamuru D, Kam M, & Canny J (2010). *An exploratory study of unsupervised mobile learning in rural India* Proceedings of the SIGCHI Conference on Human Factors in Computing Systems, Atlanta, Georgia, USA.

Mutambara D & Bayaga A (2020). Rural-based Science, Technology, Engineering and Mathematics teachers' and learners' acceptance of mobile learning. *South African Journal of Information Management*, *22*(1), 1-10.

Mutambara D & Bayaga A (2021). Determinants of mobile learning acceptance for STEM education in rural areas. *Computers & Education*, *160*, 104010.

Nestel D, Gray K, Ng A, McGrail M, Kotsanas G & Villanueva E (2014). Mobile Learning in a Rural Medical School: Feasibility and Educational Benefits in Campus and Clinical Settings. *Journal of Biomedical Education*, *1*(6), 1-8.

Nestel D Ng A, Gray K, Hill R, Villanueva E, Kotsanas G Browne C (2010). Evaluation of mobile learning: Students' experiences in a new rural-based medical school. *BMC Medical Education*, *10*(1), 57.

Wongkhamdi T, Cooharojananone N, & Khlaisang J (2017, 9-11 Nov. 2017). The study of mobile learning readiness in rural area: Case of North-Eastern of Thailand. 2017 International Symposium on Computers in Education (SIIE),

Yalcinkaya T & Cinar Yucel S (2023). Determination of nursing students' attitudes toward and readiness for mobile learning: A cross-sectional study. *Nurse Education Today*, *120*, 105652.

Zhao J, Yuping W, Maideen I, Moe Z K, & Nasirudeen A M A (2018). The Relationship between Smartphone Use and Academic Performance in a Sample of Tertiary Students in Singapore: A Cross-Sectional Study. *i-manager's Journal of Educational Technology*, *14*(4), 28-35.