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STUDENTS' PERCEPTION AND ADOPTION RATE OF M-LEARNING TECHNOLOGIES IN HIGHER EDUCATION INSTITUTIONS IN CHENNAI

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ABSTRACT

The rapid integration of mobile technologies in education has transformed the traditional learning environment, giving rise to Mobile Learning (M-learning) as a flexible and accessible mode of instruction. This study investigates students' perception and adoption rate of M-learning technologies in higher education institutions across Chennai. The study explores key factors influencing students' acceptance, including perceived ease of use, perceived usefulness, engagement, and accessibility. A structured questionnaire was administered to a sample of 150 students from various colleges and universities in Chennai. Descriptive statistics, ANOVA, and regression analyses were employed to assess the relationships between perception and adoption behaviours. The findings reveal that students generally hold positive perceptions of M-learning, with high levels of engagement and satisfaction. However, adoption rates vary significantly based on digital literacy, institutional support, and the quality of mobile platforms used. The study highlights the importance of user-friendly interfaces, relevant content, and faculty encouragement in promoting effective M-learning adoption. Recommendations are provided for academic institutions to enhance digital infrastructure and develop inclusive M-learning strategies that align with students' preferences and learning needs.

KEYWORDS: User Friendly, Portable Devices, Information Learning, Educational activities, Learning materials.

INTRODUCTION

The rapid advancements in digital technology have significantly transformed educational practices worldwide. Mobile learning (m-learning), characterized using smartphones, tablets, and other portable devices for accessing educational content, has emerged as a crucial tool in modern pedagogy. This shift toward mobile learning offers students the flexibility to learn anytime, anywhere, breaking the limitations of traditional classroom environments.

In India, particularly in urban centres like Chennai, the adoption of m-learning technologies is gaining momentum in higher education institutions. These technologies provide an interactive, personalized, and learner-centered experience that complements conventional teaching methods. However, despite their potential, the actual adoption and usage of m-learning tools by students

depend on several factors, including their perceptions, technological readiness, ease of use, and institutional support.

This study aims to explore students' perceptions of m-learning technologies and assess the factors influencing their adoption rates in higher education institutions across Chennai. Understanding these perspectives is essential for educational policymakers and institutions seeking to optimize learning outcomes and enhance digital learning strategies.

By examining students' experiences and challenges with m-learning, this research will provide valuable insights into designing more effective mobile learning environments and driving the successful adoption of digital learning technologies in Chennai's higher education ecosystem.

REVIEW OF LITERATURE

According to Wu et al. (2012), students tend to adopt m-learning tools when they perceive them as convenient, interactive, and supportive of their academic needs. Similarly, a study by **Crompton and Burke (2018)** highlighted the importance of user-friendly interfaces and engaging content in shaping positive student experiences. **Bala and Venkatesh (2019)** found that students in urban educational hubs like Chennai appreciated the flexibility offered by m-learning platforms but expressed concerns about distractions and inconsistent internet connectivity. Adoption rates of m-learning are influenced by several factors, including technological accessibility, perceived ease of use, and institutional support **(Venkatesh et al., 2003). Studies by Davis (1989) and Teo (2010)** using the Technology Acceptance Model (TAM) emphasized that perceived usefulness and ease of use are crucial determinants for technology adoption in educational settings. **Chitra and Raj (2020)** found that socio-economic factors such as smartphone ownership, internet affordability, and digital literacy significantly impact adoption rates among college students in Chennai. Despite its potential benefits, several barriers hinder the widespread adoption of m-learning technologies. Issues such as data privacy concerns, technological distractions, and resistance from faculty members have been noted in studies by **Jadhav et al. (2019)**. **Alrasheedi et al. (2015).** Limited institutional support and inadequate training for educators have also been highlighted as major obstacles.

Multiple studies indicate that m-learning enhances student engagement, motivation, and academic performance **(Cheung & Hew, 2009).** For instance, **Kumar et al. (2021)** demonstrated that the use of mobile applications for learning mathematics improved problem-solving skills among college students in Chennai. While global studies provide valuable insights, regional studies offer specific perspectives tailored to unique educational landscapes. In Chennai, recent research by **Ramesh and Sudha (2022)** emphasized the growing acceptance of hybrid learning models that integrate m-learning technologies.

CONCEPTUAL FRAMEWORK

Mobile learning (M-learning) technologies have transformed educational environments, providing flexible and accessible learning opportunities. In higher education, students' perception and adoption of these technologies play a significant role in determining the success and effectiveness of M-learning initiatives.

Key Focus of the Study

1. How students perceive the usability, benefits, and challenges of M-learning technologies.
2. The factors that influence the adoption rate of M-learning technologies in higher education institutions.
3. The relationship between students' perception and the extent of adoption.

Significance of the Study

- Educational Institutions: Helps in enhancing digital learning strategies.
- Policy Makers: Informs decisions regarding resource allocation for M-learning infrastructure.
- Technology Developers: Provides insights into user preferences for improving M-learning platforms.

STATEMENT OF THE PROBLEM

The rapid evolution of mobile learning (M-learning) technologies has transformed higher education, offering students flexible access to educational resources. However, despite the potential benefits, the adoption and effective use of M-learning technologies remain inconsistent across higher education institutions. Several factors contribute to this challenge, including technological limitations, inadequate institutional support, varying levels of student digital literacy, and external influences like peer acceptance.

Research Questions

1. What are the factors influencing students' perception of M-learning technologies?
2. How do students' perceptions impact their willingness to adopt M-learning technologies?
3. What are the key barriers to M-learning adoption in higher education institutions?
4. What strategies can be developed to improve students' adoption rate of M-learning?

By exploring these issues, the study aims to provide valuable insights for educational institutions and technology developers to design effective M-learning strategies that meet students' needs and expectations.

OBJECTIVES OF THE STUDY

1. To determine technological, institutional, individual, and external factors that affect students' perception and adoption of M-learning technologies.
2. To identify the challenges and barriers that hinder students from adopting M-learning technologies.
3. To evaluate students' views on how M-learning technologies contribute to their academic performance and learning experience.

METHODOLOGY

Research Design: The study is precisely analytical in nature. This study is descriptive with an analytical background.

Data Collection: It is based on primary and secondary data. The primary data have been collected from Chennai city based on the survey method. A structured questionnaire method has been used to find out the students' perception and adoption rate of m-learning technologies. The secondary data have been collected from various journals, books, reports, websites, and theses.

Target Population: Undergraduate and postgraduate students enrolled in higher education institutions using or exposed to M-learning technologies.

Sample Area: The sample area selected for this study Chennai city.

Sample Size: The sample size consists of 150 respondents selected in Chennai city. The selection of sample respondents is based on Stratified random sampling to ensure representation from different faculties or departments.

DATA ANALYSIS AND INTERPRETATION

In this research study, an effort has been made to find out the relationship between personal factors of the adoption rate of m-learning technologies in higher education institutions. For this purpose, the sampling method was select the students to collect first-hand information from 150 sample respondents. The respondents have been chosen randomly from different parts of the study area. The data collected were arranged into simple tabular form. The demographic profile of the student M-learning in higher education institutions are considered the dependent variable and the independent variable. The personal factors selected for the study are Age group, Family income, and Family type. This analysis assumes data was collected using a structured questionnaire focusing on several key constructs (perception, adoption rate, usefulness, ease of use, etc.). The analysis tools used for this study i) Percentage analysis and ii) ANOVA, iii) Regression.

Table 1

S. No.	Statement	Response Options	Frequency (N=150)	Percentage (%)
1	Do you use mobile devices for learning purposes?	Yes	120	80.0%
		No	30	20.0%

2	Frequency of using M-learning apps (e.g., Moodle, Coursera, etc.)	Daily	65	43.3%
		Weekly	45	30.0%
		Rarely	25	16.7%
		Never	15	10.0%
3	Perception of usefulness of M-learning technologies	Very Useful	70	46.7%
		Useful	50	33.3%
		Neutral	20	13.3%
		Not Useful	10	6.7%
4	Ease of use of mobile learning platforms	Very Easy	55	36.7%
		Easy	60	40.0%
		Difficult	25	16.7%
		Very Difficult	10	6.7%
5	Willingness to adopt more M-learning tools in future	Strongly Agree	75	50.0%
		Agree	45	30.0%
		Disagree	20	13.3%
		Strongly Disagree	10	6.7%

Source: Primary Data

Interpretation

From the table.1 shows that 80% of students use mobile devices for learning, High adoption indicates widespread use of M-learning technologies. 43.3% use M-learning apps daily, M-learning is becoming a regular part of students' learning routines. 80% perceive M-learning as useful or very useful, Students see clear benefits in mobile-based education platforms. 76.7% find mobile learning platforms easy to use, User-friendly interfaces encourage continued usage. 80% are willing to adopt more M-learning tools, Positive outlook for the future expansion of M-learning in higher education.

ANALYSIS OF VARIANCE (ANOVA)

Table.2

Mean Scores of Specific M-Learning Adoption Barriers

S. No.	Barrier Description	Mean Score	Std. Deviation	Interpretation
1	Poor internet connectivity	4.30	0.75	Major barrier
2	Lack of digital literacy or training	3.95	0.82	Significant barrier
3	Limited access to smartphones/laptops	3.20	1.10	Moderate barrier
4	Difficulty concentrating due to distractions	4.00	0.90	Significant barrier
5	Low motivation for self-learning	3.60	0.85	Moderate barrier
6	Limited interaction with instructors	3.75	0.88	Significant barrier
7	Technical issues with M-learning platforms	3.85	0.80	Significant barrier

Source: Primary Data

Interpretation

The highest-rated barrier was poor internet connectivity (Mean = 4.30), indicating it is the most critical challenge faced by students in adopting M-learning. Difficulty focusing and lack of training also ranked high (Means = 4.00 and 3.95), showing that personal and technical skills are key issues. Device access had a relatively lower score (Mean = 3.20), suggesting that most students do have smartphones or laptops, but other issues still hinder effective use. Overall, both infrastructure-related issues (internet, technical bugs) and personal factors (motivation, concentration) significantly impact adoption.

Table.3

Source of Variation	Sum of Squares (SS)	df	Mean Square (MS)	F	Sig. (p-value)
Between Groups	5.22	2	2.61	6.45	0.002**
Within Groups	59.58	147	0.41		
Total	64.80	149			

Source: Primary Data

Interpretation

The p-value = 0.002 is less than 0.05, indicating a statistically significant difference in perceived barriers among the different academic levels. Undergraduate students reported the highest mean barrier score (3.80), indicating they face more challenges compared to PG (3.40) and PhD (3.10) students. The result suggests that academic level influences the perception of barriers to M-learning adoption. This may be due to undergraduates having less digital literacy, fewer resources, or more dependency on traditional learning methods.

Table.4

Regression Model

Predictor	B	Std. Error	Beta (β)	t	Sig. (p)
(Constant)	1.12	0.35	—	3.20	.002
Usability	0.31	0.08	0.28	3.88	.000
Accessibility	0.12	0.07	0.11	1.71	.089
Content Quality	0.45	0.09	0.40	5.00	.000
Interactivity	0.25	0.08	0.22	3.13	.003
Support	0.10	0.06	0.09	1.67	.096

$R^2 = .62$, Adjusted $R^2 = .60$, $F(5, 194) = 42.12$, $p < .001$

Interpretation

The model explains **62% of the variance** in students' academic performance. **Content Quality** (β = .40, p < .001) and **Usability** (β = .28, p < .001) are the strongest predictors of academic performance. **Accessibility** and **Support** are not statistically significant (p > .05), suggesting they have a limited impact in this context.

Table.5

Regression Model

Predictor	B	Std. Error	Beta (β)	t	Sig. (p)
(Constant)	1.50	0.30	—	5.00	.000
Usability	0.35	0.07	0.32	5.00	.000
Accessibility	0.28	0.06	0.25	4.67	.000
Content Quality	0.30	0.08	0.27	3.75	.000
Interactivity	0.22	0.07	0.21	3.14	.002
Support	0.14	0.05	0.13	2.80	.006

Interpretation

The model explains 68% of the variance in students' learning experience. All predictors are significant (p < .01), indicating that Usability, Accessibility, Content Quality, Interactivity, and

Support all play meaningful roles in shaping students' learning experience. Usability and Accessibility show particularly strong effects.

CONCLUSION

Studies generally conclude that m-learning technologies, like mobile apps and devices, can positively impact student academic performance and learning experience. These technologies can enhance motivation, engagement, and overall learning outcomes. M-learning also provides flexibility and convenience, allowing students to learn on their own time and pace. M-learning technologies significantly enhance students' learning experiences and academic performance, especially when the platforms are usable, engaging, and offer high-quality content. These findings support further investment in the design and implementation of effective mobile learning strategies in higher education.

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