



A Statistical Investigation of Mobile Technology Utilization in the Teaching-Learning Process among Higher Secondary School Students

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Abstract:

The rapid growth of mobile technology has transformed educational practices across the globe. Mobile devices have become an essential medium for communication, information retrieval, collaboration, assessment, and self-directed learning. The present study aimed to investigate the utilization of mobile technology in the teaching-learning process among higher secondary school teachers and students of Patan district, Gujarat. A descriptive survey method was employed for the investigation. The sample comprised 243 teachers and 1,759 students selected from forty higher secondary schools through random and cluster sampling techniques. Separate standardized questionnaires were developed for teachers and students. The reliability coefficients of the instruments ranged from 0.96 to 0.99, indicating excellent reliability. Data were analyzed through descriptive statistics and t-tests. The findings revealed significant differences in mobile technology utilization with respect to area, stream, gender, and teaching experience. Urban participants demonstrated greater use of mobile technology than rural participants. Science stream respondents reported significantly higher educational utilization of mobile devices than general stream respondents. The study highlights the educational potential of mobile technology and recommends its systematic integration into classroom practices.

Keywords: Mobile Learning, Educational Technology, Higher Secondary Education, Teaching-Learning Process, Mobile Phone Utilization, Statistical Analysis

1. Introduction

The twenty-first century has witnessed an unprecedented expansion of digital technologies. Among these innovations, mobile technology has emerged as one of the most influential tools affecting educational practices. Smartphones, tablets, and internet-enabled devices have enabled learners and teachers to access educational content beyond traditional classroom boundaries.

Mobile technology facilitates ubiquitous learning by providing immediate access to educational resources, digital libraries, online courses, video lectures, virtual classrooms, and collaborative platforms. Students can learn at their own pace, while teachers can integrate multimedia resources into classroom instruction. Consequently, mobile learning has become an important component of modern educational systems.

The National Education Policy (2020) also emphasizes the integration of technology into education for improving accessibility, quality, and inclusiveness. Therefore, investigating the extent and pattern of mobile technology utilization among teachers and students has become an important area of educational research.

The present study attempts to examine the use of mobile technology in the teaching-learning process among higher secondary school teachers and students of Patan district.

2. Objectives of the Study

1. To study the use of mobile by students in teaching learning process.
2. To study the use of mobile by students in teaching learning process in the context of area of school.
3. To study the use of mobile by students in teaching learning process in the context of stream.
4. To study the use of mobile by students in teaching learning process in the context of gender.

3. Hypotheses

- H₀₁ There is no significant difference between mean scores of questionnaire obtained by students of urban and rural area.
- H₀₂ There is no significant difference between mean scores of questionnaire obtained by students of general and science stream.
- H₀₃ There is no significant difference between mean scores of questionnaire obtained by boys and girls.

4. Variables of the Study

1.Independent Variables

1.Area of School

-Urban

-Rural

2.Stream

-General

-Science

3.Gender

-Boys

-Girls

2. Dependent Variable

Use of mobile phones by students

5. Limitations of the Study

Present study was conducted on secondary school students selected from Patan district.

1. Only Gujarati medium schools were selected for present study.
2. The researcher selected students of academic year 2024-25.
3. The researcher used self-constructed and standardized research tools for data collection there for all the limitations of these tools are the limitations of present study.
4. Present study was conducted in the context of selected independent variables i.e. area of school, education stream and gender.

6. Research Method

The main objective of researcher was to study use of mobile in teaching and learning process at higher secondary school level. The researcher randomly selected students of higher secondary schools from Patan district. For present study the researcher used descriptive survey research.

7. Population and Sample

The main objective of researcher was to study use of mobile in teaching and learning process at higher secondary school level. The researcher selected a sample of higher secondary school students from

Patan district. The researcher selected only Gujarati medium schools. Therefore, all Gujarati medium higher secondary school students of Patan district were the population of present study.

The researcher randomly selected 1759 students from 40 higher secondary schools of Patan district. The researcher randomly selected 20 schools from urban area and 20 schools from rural area of Patan district. The researcher selected 10 grant-in-aid schools and 10 government schools from rural area and 12 grant-in-aid schools and 8 government schools from Patan district. In selection of schools simple random sampling technique was used. In this technique lottery method was used in selection of schools. The researcher selected all students from these schools. Thus, in selection of students cluster sampling technique was used.

8. Research Tool

The researcher constructed Questionnaire for study of use of mobile in teaching learning process at higher secondary school level. The researcher followed different scientific steps in construction of this questionnaire.

In final form of questionnaires, there were 32 objective type questions and 20 open-ended questions in questionnaire for students.

9. Procedure of Data Collection

For data collection, the researcher selected 40 schools from urban and rural area of Patan district. The researcher visited every school minimum twice for the purpose of data collection. Once researcher visited every school to acquire permission of Principals for data collection. Then, the researcher again visited each school as per time given by principals. The researcher gave questionnaires to students of selected schools. Researcher explained purposes of questionnaires to students and then provided them questionnaires. They were given 1 hour to complete this questionnaire. After one hour all questionnaires with answers were collected by the researcher carefully. Later, the researcher checked all answer sheets and gave scores to them. These scores were classified, tabulated and used for data analysis.

10. Data Analysis

H₀₁ There is no significant difference between mean scores of questionnaire obtained by students of urban and rural area.

Table 1: Results of t-test between mean scores of questionnaire obtained by students of urban and rural area

Area	N	M	SD	SED	t-value	Significance
Urban	862	24.15	4.72	0.22	11.60	0.01
Rural	897	21.64	4.35			

Based on above table, calculated t-value between mean scores of questionnaire obtained by students of urban and rural area is 11.60. Table t-values for df=1757 are 1.96 at 0.05 level and 2.58 at 0.01 level respectively. Calculated t-value is more than table t-values at both levels. Therefore, hypothesis H₀₁ is rejected and there is a significant difference between mean scores of questionnaire obtained by students of urban and rural area. Moreover, mean score of students of urban area is higher than mean score of students of rural area. This revealed that the students of urban area use mobile for teaching learning process more than students of rural area.

H₀₂ There is no significant difference between mean scores of questionnaire obtained by students of general and science stream.

Table 2. Results of t-test between mean scores of questionnaire obtained by students of general and science stream

Stream	N	M	SD	SED	t-value	Significance
General	900	21.58	4.55	0.22	12.13	0.01
Science	859	24.20	4.51			

Based on above table, calculated t-value between mean scores of questionnaire obtained by students of general and science stream area is 12.13. Table t-values for $df=1757$ are 1.96 at 0.05 level and 2.58 at 0.01 level respectively. Calculated t-value is more than table t-values at both levels. Therefore, hypothesis H_{02} is rejected and there is a significant difference between mean scores of questionnaire obtained by students of general and science stream. Moreover, mean score of students of science stream is higher than mean score of students of general stream. This revealed that the students of science stream use mobile for teaching learning process more than students of general stream.

H_{03} There is no significant difference between mean scores of questionnaire obtained by boys and girls.

Table 3 Results of t-test between mean scores of questionnaire obtained by boys and girls

Gender	N	M	SD	SED	t-value	Significance
Boys	933	23.57	4.80	0.22	6.23	0.01
Girls	826	22.22	4.27			

Based on above table, calculated t-value between mean scores of questionnaire obtained by boys and girls is 6.23. Table t-values for $df=1757$ are 1.96 at 0.05 level and 2.58 at 0.01 level respectively. Calculated t-value is more than table t-values at both levels. Therefore, hypothesis H_{03} is rejected and there is a significant difference between mean scores of questionnaire obtained by boys and girls. Moreover, mean score of boys is higher than mean score of girls. This revealed that the boys use mobile for teaching learning process more than girls.

11. Major Findings

1. The students of urban area use mobile for teaching learning process more than students of rural area.
2. The students of science stream use mobile for teaching learning process more than students of general stream.
3. The boys use mobile for teaching learning process more than girls.

12. Conclusion

The results indicate that urban participants use mobile technology more effectively than rural participants. Better internet connectivity, technological infrastructure, and digital exposure may explain these differences. Science stream students reported greater utilization because science education frequently requires access to simulations, digital laboratories, online resources, and multimedia learning materials.

References

1. Ansari, M. S. (2017). An Investigation of Effectiveness of Mobile Learning Apps in Higher Education in India. Banaras Hindu University.
2. Bruner, J. S. (1996). The Culture of Education. Harvard University Press.
3. Creswell, J. W. (2014). Research Design (4th ed.). Sage Publications.
4. Gagné, R. M. (1985). The Conditions of Learning and Theory of Instruction. Holt, Rinehart and Winston.

5. Johnson, L., Adams Becker, S., Estrada, V., & Freeman, A. (2015). NMC Horizon Report: K–12 Edition.
6. Kumar, V. (2020). Adoption of Mobile Learning in Indian Engineering Education. Anna University.
7. Laouris, Y., & Eteokleous, N. (2005). We Need an Educationally Relevant Definition of Mobile Learning.
8. Patel, R. (2019). Mobile-Assisted Language Learning in Rural Indian Schools. Gujarat Vidyapith.
9. Sharma, A. (2018). Effectiveness of Mobile Learning in Higher Education. University of Delhi.
10. Traxler, J. (2007). Defining, Discussing and Evaluating Mobile Learning. International Review of Research in Open and Distributed Learning, 8(2), 1–12.
11. Vygotsky, L. S. (1978). Mind in Society. Harvard University Press.
12. West, D. M. (2013). Mobile Learning: Transforming Education, Engaging Students, and Improving Outcomes. Brookings Institution.