Attitude of Mobile Assisted Pedagogy Approach in Teaching Science and Academic Achievement in Pedagogy Subject of Prospective Teachers

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Abstract- *Teaching of science is very challenging and more task oriented, there are several teaching approaches were available to teach the pedagogy subject such as constructivist approach, inquiry based teaching, reflective teaching approach, collaborative, integrative and techno-pedagogical approach. Hence, this present investigation aims to assess the attitude of mobile assisted pedagogy approach in teaching science and academic achievement in pedagogy subject of prospective teachers. The objective of the study is to find out the level of attitude of mobile assisted pedagogy approach in teaching science among prospective teachers and also to find out the significant difference between the subs samples such as gender, major subject, access of mobile application for learning and educational qualification. For the purpose of this study survey method was adopted and 171 B.Ed., teacher trainees from Chennai district of Tamil Nadu constituted sample for this present investigation. Sample selection was made using stratified random sampling technique. Collected samples were subjected to statistical analysis to form meaningful interpretation. The result revealed that the level of attitude of mobile assisted pedagogy approach in teaching science of prospective teachers is moderate in nature and there is a significant difference is exists based on the sub samples. Based on the result pedagogy approach of future teachers will be increased with the support of new mobile technology.*

Key Terms: Attitude, Mobile Assisted, Pedagogy Approach, Academic Achievement.

Introduction

The rapid development of Information and communication technology (ICT) in the field of education especially teaching the science subject with the support of newly introduced teaching assistive device and applications. Recent days of school and college education have shifted from traditional classroom approaches to techno mediated teaching and learning environment by which it is imparting the subject knowledge to the students with more effective using various technological aids and mobile software (Karsenti, 2001).

Pedagogy Appraoches

Pedagogy is an understanding of how teaching and learning can be transformed and carried out with the assistance of various strategies, procedures, processes and methods. Acquiring techno-pedagogical competencies will make teaching and learning more pleasurable and meaningful

endeavour as it will lessen the pressure on the part of the teachers and enable the students to develop deeper domain of knowledge (Padmavathi, 2016).

In the recent days there are numerous techniques and strategies are used to deliver the pedagogical content knowledge to the students, and these recent techniques are collectively called as pedagogical approaches (Pradeep Kumar, 2018). The followings are the important pedagogical approaches that are utilized by the teachers to transact the science content. The science curriculum may adopt various pedagogical approaches such as constructivism, inquiry based, reflective teaching approach, and collaborative, integrative and techno-pedagogical approach.

Mobile Technology

The recent research survey of education and technology have pointed out that the mobile applications have a great deal and are effectively using as a teaching-learning tool and are increasing efficiency and effective classroom interaction that may facilitate students academic achievement. The report of the University of KwaZulu-Natal, 92% of students said that learning through mobile is making easier to understand the subject content and improving learning capacity. Similarly there are numerous mobile software and mobile applications have great contribution in teaching the subjects especially for the science subjects (Preeti Bala and Imlikokla, 2018). The following mobile applications are considered to be very important and easily used for teaching and learning such as FxGuru, Evernote, Human Anatom, Kahoot, DU, Rcorder, and Photo Math and so on.

Need and Importance of the Stuidy

Mobile assisted pedagogy approach is an important concept in teaching science subject since; the usage of smart phones has increased and is widely used for man educational purpose. Teachers and students are commonly using the mobile applications for teaching as well as learning purpose. There new pedagogy approaches have been adopted for teaching and learning to enhance the pedagogy content knowledge of the students. The recent educational surveys says the students are more comfortable in learning the subject content through the mobile phones and the advance techniques now it called as techno-pedagogical approach in learning.

Therefore, it is mandatory to assess the student teachers (B.Ed., Teacher Trainees) attitude towards mobile assisted pedagogy approaches in relation to their pedagogy achievement. This study will be of more useful for the future teachers to make sure about the awareness and utilization of many mobile applications in teaching and learning that impart pedagogy content to the students. Based on the investigation the teacher trainees may be provided with training the recent mobile technologies that enhance pedagogy content delivery.

Statement of the Problem

The problem taken for the present study is “Attitude of Mobile Assisted Pedagogy Approach in Teaching Science and Academic Achievement in Pedagogy Subject of Prospective Teachers.”

Objectives of the Study

The present study was conducted with the following objectives in mind:

1. To find out the prospective teachers' level of attitude towards mobile assisted pedagogy approach.

2. To find out there is any significant difference of prospective teachers' level of attitude towards mobile assisted pedagogy approach based on: Gender, Major Subject, Mobile access for Learning and Educational Qualification.

3. To find out the relationship between attitude of mobile assisted pedagogy approach and academic achievement in pedagogy subject of prospective teachers.

Hypothesis of the Study

1. There is no significant difference exist in the prospective teachers' level of attitude towards mobile assisted pedagogy approach based on: Gender, Major Subject, Mobile access for Learning and Educational Qualification.

2. There is no significant relationship between attitude of mobile assisted pedagogy approach and academic achievement in pedagogy subject of prospective teachers.

Method of the Study

Normative survey method was adopted for this study, since this method research is a very popular method of investigation in educational research to find a concrete solution for the problems selected.

Population and Sample

The population for the present study comprised of the B.Ed., teacher trainees from Chennai district of Tamil Nadu. The sample of the present study is 171 B.Ed., teacher trainees from science stream (Botany, Zoology, Physics and Chemistry) were selected using stratified random sampling technique.

Tool Used

In the present study a five point attitude scale was used to collect data from science B.Ed., teacher trainees. The questionnaire was constructed and validated by the investigator. The questionnaire consists of 52 statements and it was prepared under five dimensions (Mobile Driven Materials and Practices, Interactivity in the Classroom, Pedagogy Knowledge Acquisition, Awareness of Mobile Applications and Pedagogy Appropriateness) out of which 36 positive and 16 negative statements. Reliability of the tool is found to be 0.836 (Split Half) and the validity of the tool is 0.914 Semester mark of the students was taken to assess the academic achievement (Pedagogy subject alone).

Data Analysis

The following statistical techniques were used: Descriptive Analysis, and Inferential Analysis (t-test, F-test), correlation were done and it was interpreted and tabulated.

Descriptive Analysis

Table 1: Sub sample wise Mean and SD

Variables	**Categories**	***N***	**Mean**	**SD**
Gender	Male	96	187.19	16.246
	Female	75	178.44	21.705
Subject	Botany	32	185.56	20.385
	Zoology	49	178.51	18.582
	Physics	54	183.43	19.582
	Chemistry	36	187.86	17.999
Mobile access for Learning	Yes	111	184.76	18.288
	No	60	180.75	20.887
Qualification	UG	96	182.91	19.241
	PG	75	183.92	19.432

Table 2: Dimension wise Mean and SD

Dimensions	N	Mean	Std. Deviation	Percentage
Mobile Driven Materials and Practices	171	38.12	6.224	20.79
Interactivity in the Classroom	171	35.46	5.669	19.34
Pedagogy Knowledge Acquisition	171	34.33	6.046	18.72
Awareness of Mobile Applications	171	38.30	6.203	20.88
Pedagogy Appropriateness	171	37.13	8.324	20.25

Inferential Analsis

Table 3: Level of attitude towards mobile assisted pedagogy approach of Prospective Teachers

Variable	Level	Frequency	Percentage
Attitude of mobile assisted pedagogy approach	Low	27	15.8
	Moderate	114	66.7
	High	30	17.5

It has been observed from the Table 3, that the 15.8%, 66.7%, 17.5% of the sample have low, moderate and high level. The result revealed that the attitude of mobile assisted pedagogy approaches in teaching science of prospective teachers is moderate in nature (17.5%).

Inferential Analysis

Hypothesis 1

Table 4 : Mean, SD, and *t*-Value of attitude towards mobile assisted pedagogy approach of Prospective Teachers with respect to Gender

Attitude of mobile assisted pedagogy approach	Male		Female		*t*- value	*p*- value
	Mean	SD	Mean	SD		
	187.19	16.246	178.44	21.705	6.468*	.012

*Significant at 0.01 level

It has been observed from the Table 4 that the calculated mean score of male teacher trainees in their attitude of mobile assisted pedagogy approach in teaching science is 187.19 and female is 178.44 and the calculated *t*- value is 6.468 which is greater than table the value and it is statistically significant at 0.01 level. Hence, the framed null hypothesis is not accepted. The result revealed that the male B.Ed., teacher trainees have more attitude than the female teacher trainees.

Hypothesis 2

Table 5: Mean, SD, and *t*-Value of attitude towards mobile assisted pedagogy approach with respect to Major Subject

Variable	Source of Variance	Sum of squares	Df	Mean square	*F*- value	*p*- value
Attitude of mobile assisted pedagogy approach	Between groups	2037.318	3	679.106	1.856	.139
	Within groups	61117.629	167	365.974		
	Total	63154.947	170			

It has been observed from the Table 5, that the calculated *F*- value is 1.856 and the *p*- value is .139. The calculated *F*-value is lower than the table value and it is not statistically significant. Hence, the framed null hypothesis is accepted. Further, the result revealed that there is no group difference among Botany, Zoology, Physics and Chemistry major subject B.Ed., teacher trainees in their Attitude towards mobile assisted pedagogy approach.

Hypothesis 3

Table 6: Mean, SD, and *t*- Value of towards mobile assisted pedagogy approach with respect to Mobile access for Learning

Attitude of mobile assisted pedagogy approach	Yes		No		*t*-value	*p*-value
	Mean	SD	Mean	SD		
	184.76	18.288	180.75	20.887	2.827*	.034

*Significant at 0.01 level

It has been observed from the Table 6 that the calculated mean score of mobile access for learning B.Ed. teacher trainees is 184.76 and not accessing mobile phone for their learning is 180.7, and the calculated *t*- value is 6.468 which is greater than the table the value and it is statistically significant at 0.01 level. Hence, the framed null hypothesis is not accepted. The result revealed that the B.Ed., teacher trainees who accessing mobile phone for learning have more attitude towards mobile assisted pedagogy approach in teaching science than the teacher trainees who are not accessed mobile phones for learning.

Hypothesis 4

Table 7: Mean, SD, and *t*- Value of attitude towards mobile assisted pedagogy approach with respect to Qualification

Attitude of mobile assisted pedagogy approach	UG		PG		*t*-value	*p*-value
	Mean	SD	Mean	SD		
	182.91	19.241	183.92	19.432	.286	.593

It has been observed from the Table 7 that the calculated mean score of UG qualified B.Ed. teacher trainees is 182.91 and PG qualified B.Ed. teacher trainees is 183.92, and the calculated *t*- value is .286 which is lower than the table the value and it is not statistically significant. Hence, the framed null hypothesis is accepted. The result revealed that there is no difference between UG qualified and PG qualified B.Ed., teacher trainees in their attitude towards mobile assisted pedagogy approach in teaching science.

Hypothesis 5

Table 8: Relationship between attitude of mobile assisted pedagogy approach and academic achievement in pedagogy subject

Variables	***r*- value**	***p*-value**	**Relationship**
Attitude of mobile assisted pedagogy approach **Vs.** **Academic Achievement in Pedagogy subject**	. 589	.000*	High level of positive relationship

*Significant at .01 level.

It has been observed from the Table 8, that the calculated r-value is .589 and the p-value is .000, the calculated r-value is statistically significant at 0.01 level. Therefore, there is a high level of positive relationship is found between the attitude towards mobile assisted pedagogy approach in teaching science and academic achievement in pedagogy subject of prospective teachers.

Major Findings

1. The level of B.Ed., teacher trainees' attitude of mobile assisted pedagogy approach in teaching science is moderate in nature.
2. There is a significant difference between male and female B.Ed., teacher trainees attitude of mobile assisted pedagogy approach in teaching science. Male students have more attitude than the female students.
3. There is no group difference is found based on the B.Ed., teacher trainees' major subjects such as Botany, Zoology, Physics and Chemistry.
4. There is a significant difference between the students who access mobile for their learning and not accessing mobile for learning. The students who access mobile phone for learning have more attitude towards mobile assisted pedagogy approach in teaching science than the students of not accessing mobile phones for their learning.
5. There is no significant difference between UG and PG students in their attitude of mobile assisted pedagogy approach in science.
6. There is a high level of positive relationship is found between attitude of mobile assisted pedagogy approach in teaching science and academic achievement in pedagogy subject.

Educational Implications

The recent advancement in information and communication technology in the field of education has brought uniqueness in the concept of teaching and learning. The mobile technology is also contributing in effective transaction of pedagogy content knowledge to the students. Therefore, this study has more educational values in terms of assessing future teacher trainees' attitude towards mobile assisted pedagogy approach in teaching science. Future teachers of science may be familiarized in terms of various mobile applications and freely available mobile software that facilitate the science teaching in the classroom. This study will help the teacher trainees to develop their various pedagogical approaches and that will enhance their techno-pedagogy competency.

Recommendations

1. Mobile assisted pedagogy approach shall be included in the two year B.Ed., curriculum.
2. The trainees may provide with hands on training during the pedagogy classes with the mobile applications and software.
3. There may be pedagogy enrichment program for science prospective teachers organized.

Suggestions for Further Study

1. The study may be conducted for the school and teacher educators to assess their awareness and attitude towards mobile assisted pedagogy approach.
2. It may be compared with the teacher effectiveness and other similar variables.
3. The effectiveness of mobile applications in teaching science may be taken up as an experimental study.
4. The study may be conducted for arts stream students to assess their attitude and awareness.

Conclusion

The result revealed that the attitude of B.Ed., teacher trainees towards mobile assisted pedagogy approach in teaching science is moderate in nature. Hence, the teacher trainees' knowledge on various mobile applications and software should be increased and they are trained such a way to concentrate much on the new techno-pedagogy approach in teaching the subject. The curriculum and teaching strategies at B.Ed., level may adapt the recent advancement in mobile technology and pedagogy approaches.

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