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Blending Technology with Physical Science Teaching By Prospective Teachers

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Abstract

The 21st century teaching, particularly science teaching warrants the use of high end technology enabled tools and techniques. The creation of digital lesson plans, blogs, presentations have now become an inevitable element in science teaching and learning. This paper briefly describes the technology integration of prospective physical science teachers in their classrooms. Selected web 2.0 tools and their integration in physical science teaching by the prospective teachers were studied using a competence scale. The statistical techniques include t-test and ANOVA. The gender and type of management of the prospective teachers were the subsamples of the study. The sample for the study consisted of 200 prospective physical science teachers studying in various government, aided, university centers and self-financing institutions. The findings reveal that the physical science teachers differ significantly with respect to their gender on integrating technology into physical science teaching.

Keywords: Technology enabled tools, web 2.0 tools, prospective teachers

1. Introduction

The 21st century science teaching can explore the wide end arenas of technology enabled tools and techniques. The science teachers are to be equipped with the so called latest pedagogical resources so as to deliver effective and interactive sessions to the children. The web 2.0 tools includes blogs, wikis, google docs, edmodo, google earth, second life, you tube, twitter, facebook, presentations and many more which can enhance the creative learning capacities of the children. The children can enjoy the simulations produced with the help of such technology enabled tools and thus can have a joyful science learning environment. The world has become a technology enabled gadget which needs competent individuals to work upon. So, in order to build up such a world in blood and bones the 21st century teachers, especially the science teachers are to play a vital role.

Literature Review

The technology integration into teaching has been rightly put forward by UNESCO in the UNESCO ICT competency framework for teachers. The literature examines the broad areas of technology integration into teaching and learning purposes. It says that certain digital competencies are to be possessed by the 21st century teachers so as to make their classes interactive and interesting in the present century.

Smith & Greene (2013) ^[3] in their research paper entitled Pre-Service Teachers Use E-learning Technologies to Enhance Their Learning indicate mixed results regarding the use of e-learning to prepare pre-service teachers in learning to teach. Over half of the pre-service teachers (56%) strongly agreed or agreed that e-learning had improved their teaching during their practicum experience. 63% posted that feedback from peers and professors improved the delivery of their lessons and that viewing the video clips improved their teaching.

The paper is divided into two parts, Importance of technology integration in Science teaching and Competence in Technology integration. The first part of the paper briefly describes how science teaching can be supplemented with effective technology integration and the second part briefly examines the competence of various physical science prospective teachers in integrating the technological tools and techniques into physical science teaching.

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Problem Statement

Blending Technology with Physical Science Teaching By Prospective Teachers

Scope of Research

Creating a techno pedagogic content material is an important task in the present century. In order to develop a critical consciousness in the judicious use of technology enabled tools in teaching, proper training and practice is very much essential. This paper examines whether there exists any gender differences in the technology integration in science teaching. It also examines the type of management of the prospective teachers and their difference in technology integration. The area and the subject are to be studied very much deeply as the world is developing day by day. All the technological developments happening in the modern world is sure to reflect upon the teaching learning scenario. Hence the Science teachers are to be vigilant in employing such modern technologies in to science teaching so as to prepare the future generations to the fast growing world.

Objective of the Study

- To investigate the competence of prospective physical science teachers in the effective integration of technology in the traditional classrooms with respect to the sub-samples based on gender and type of management.

Hypotheses of the Study

In order to achieve the above said objective of the study the investigators formulated the following hypotheses:

- There exists no significant difference in the competence of prospective physical science teachers in the effective integration of technology in the traditional classrooms with respect to the subsample based on the gender of the prospective teachers.
- There exists no significant difference in the competence of the prospective physical science teachers in the effective integration of technology in the traditional classrooms with respect to the subsample based on the type of management of prospective teachers.

Methodology

Importance of technology integration in Science teaching
The study was conducted by the researchers stating the importance of technology integration into science teaching to the chosen sample of prospective teachers. The prospective teachers were given a class of technology integration and importance of web 2.0 tools in traditional science classrooms. The duration of the class was thirty minutes. The class was taken using a Microsoft Power Point presentation which included videos of experiments, recorded audios,

blogging and animation clippings of secondary school science theory.

Competence in technology integration

The second part of the study included the administration and scoring of the technology integration competence scale among physical science prospective teachers. A competence scale was given to the teacher trainees and they were asked to record their responses in the scale response sheet. Appropriate instructions for filling the scale response sheet were given and thus the competence scale was distributed among the chosen sample.

In the present study, survey method was employed in order to know the competence of the prospective physical science teachers in the effective integration of technology into the traditional classrooms.

Population and Sample

The population for the present study consisted of prospective physical science teachers studying in various colleges of teacher education in Kerala. The total sample for the present study consists of 200 teacher trainees. To obtain sample representatives of population, the investigator follows simple random sampling technique on various teacher education colleges of Palakkad and Thrissur and Malappuram district in Kerala.

Tool: Competence Scale of Technology Integration into Science Teaching

The investigators constructed and standardized a competence scale for measuring the effective integration of technology into classrooms by the prospective physical science teachers. It is a five point scale with alternatives, Strongly Agree, Agree, Undecided, Disagree and Strongly Disagree.

Statistical Techniques

Mean, standard deviation, t-test, ANOVA

Data Analysis

Hypothesis 1:

There exists no significant difference in the competence of the prospective physical science teachers in the effective integration of technology in the traditional classrooms with respect to the subsample based on the gender of the prospective teachers.

The result of the analysis of significance of difference in the mean scores of competence in the effective integration of technology into the traditional classrooms among male and female prospective teachers in government, self financing, university centre and aided training colleges with respect to their gender are presented in Table 1.

Table 1: Data and result of the significance of difference in the mean scores of competence in the effective integration of technology into classrooms among male and female prospective physical science teachers in government, university centre, self financing and aided training colleges based on the sub sample gender.

Variable	Gender	N	Mean	SD	T
Competence scale of blending technology with science teaching	Male	49	59.92	7.427	2.352*
	Female	151	54.30	9.550	

* Indicates significance at 0.05 level

From Table 1 it is found that the ‘t’ value of the competence in the effective integration of technology into classrooms among male and female prospective physical science

teachers in government, university centre, self financing and aided training colleges is 2.352 which is significant at 0.05 level of significance.

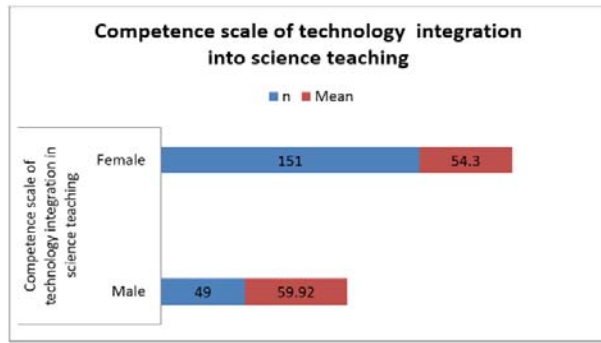


Fig 1: Bar diagram showing the significant difference in the competence of effective integration of technology into classrooms based on the sub sample gender.

Hence the hypothesis 1 “There exists no significant difference in the competence of the prospective physical

Table 2: Data and result of the significance of difference in the mean scores of competence in the effective integration of technology into classrooms among male and female prospective physical science teachers studying in government, university centre, self financing and aided training colleges based on the sub sample type of management.

Variable	Groups	Sum of squares	df	Mean squares	F	p
Competence in web 2.0 integration	Between groups	151.623	3	50.541	0.430	p> .05
	Within groups	23032.457	196	117.513		
	Total	23184.080	199			

The Table 2 shows that the calculated value of F in the competence of technology integration is 0.430 which is lesser than the table value 2.65 at 0.05 level of significance. It means that there exists no significant difference in the competence of effective integration of technology into classrooms by prospective physical science teachers studying in the aided, centre, government and self financing training colleges of Calicut University with respect to the type of management of their colleges.

Hence the hypothesis, “There exists no significant difference in the competence of the prospective physical science teachers in the effective integration of technology in the traditional classrooms with respect to the subsample based on the type of management of prospective teachers.” cannot be rejected.

Findings

On the basis of results obtained after the data analysis and result interpretations, the following findings have been drawn:-

- There exists significant difference in the competence of prospective physical science teachers in the effective integration of technology in the traditional classrooms with respect to the subsample based on the gender of the prospective teachers.
- There exists no significant difference in the competence of the prospective physical science teachers in the effective integration of technology in the traditional classrooms with respect to the subsample based on the type of management of prospective teachers.

Conclusion

The major findings of the study reveal that only through appropriate training and adequate practice technology can be effectively integrated into the 21st century classrooms. There exist significant differences in the competence of prospective physical science teachers with respect to their gender in the practice of effective technology integration into their

science teachers in the effective integration of technology in the traditional classrooms with respect to the subsample based on the gender of the prospective teachers.” is rejected.

Hypothesis 2

There exists no significant difference in the competence of the prospective physical science teachers in the effective integration of technology in the traditional classrooms with respect to the subsample based on the type of management of prospective teachers.

The result of the analysis of significance of difference in the mean scores of competence in the effective integration of technology into classrooms among male and female prospective physical science teachers studying in government, self financing, university centre and aided training colleges with respect to their type of management are presented in Table 2.

classrooms. Hence it is the need of the hour to get well trained in the modern pedagogical practices so as to effectively integrate the technology into the 21st century classrooms.

Educational Implications

The 21st century teaching, particularly the science teaching has to take into consideration the leaps and bounds of the present progressive world. The science laboratory training and the nurturing of science domain among students are possible only if proper science teaching is clubbed with effective simulations and interactive technology enabled sessions. This will help the students gain a proper understanding of what they learn and what they practice. Hence such sessions are to be given by the teachers of the secondary schools to build up a knowledgeable generation for tomorrow. These all are possible only through the judicious application of technology integration by the physical science teachers in the process of efficient teaching and learning of science.

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