Teacher as an Agent or Barrier to Integrated Technology

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ABSTRACT

Technology integration indicates using computers effectively and efficiently in the general content areas to allow students to learn how to apply computer skills in meaningful ways. Teachers’ attitudes toward technology usage can be concerned as a facilitating or hindering factor to utilize technology in their educational environment. In the present study sample includes equal number of humanities and science teacher from government and private schools of Punjab. Standardized scale of Attitude towards ICT developed by Mehra & Far (2013) was used. A significant difference of attitude towards the integrated technology in education among private schools’ science and humanities teachers was found. The major findings are Science teachers have more availability of resources and materials as more technological aids have been developed in science stream. Humanities teachers may use more creative techniques and drills for concept attainment.

Keywords: Integrated technology, Attitude, Science teachers, Humanities teachers

1. Introduction

Education is the most important investments in building human capital in a country and a medium that not only shapes literate citizens but also makes a nation technologically innovative, thus, paving a path to economic growth. Today children are living in digital era. They have so many e-learning platforms in their hands. The transition from rote learning to tech-based education is clearly evident. Smart Boards, CDs, and e-learning, e-tab are now part of everyday education. The Information and Communication Technology (ICT) in Schools was launched in December, 2004 and revised in 2010 to provide opportunities to secondary stage students to mainly build their capacity on ICT skills and make them learn through computer aided learning process.

Integrated Technology

Integrated Technology literally means incorporating technology and technological aids in education in such a manner that enhances student learning. Discrete computer skills take on new meaning when they are integrated within the curriculum and facilitate education. For example, Wentworth (2009), explored using an online environment and argumentation as a tool to engage students in mathematical discourse.

James (2011) examined the use of asynchronous discussion boards to promote active learning, stimulate motivation, and foster critical thinking among students. Hence, technology integration is using software supported by the business world for real-world applications so that students learn to use computers flexibly, purposefully and creatively. Technology integration is having the curriculum drive technology usage, not having technology drive the curriculum. Finally, technology integration is organizing the goals of curriculum and technology into a coordinated, harmonious whole.

“Curriculum integration with the use of technology involves the infusion of technology as a tool to enhance the learning in a content area or multidisciplinary setting. Effective integration of technology is achieved when students are able to select technology tools to help them obtain information in a timely manner, analyze and synthesize the information, and present it professionally. The technology should become an integral part of how the classroom functions—as accessible as all other classroom tools. The focus in each lesson or unit is the curriculum outcome, not the technology.” This definition is given by The International Society for Technology in Education (ISTE), a leader in helping teachers become more effective users of technology.

Attitude

The term Attitude has not been and probably cannot be distinguished clearly from such terms as trait opinion, interest value and temperament. Most often it is used to describe an emotional reaction, either favourable or unfavourable towards some object or class of objects.

An attitude may be defined as a perception orientation and response in relation to an object or class of objects or a class of stimuli. An Attitude is a pre-disposition to react negatively or positively in some degree towards a class of object, ideas, institutions or people. Since Attitude determines the negative or positive character of one response to various kind of stimuli or diverse types of situations, their importance in life cannot be over stated.

Christopher (1986) argued that attitude is a tendency to evaluate a stimulus with some degree of favour or disfavour, usually expressed in cognitive, affective or behavioral responses. In this way they can be viewed as acquired tendencies to act in specific ways, towards or against an environmental factor which is imbued with either negative or positive value. More recent research indicates that attitude represents a summary evaluation of a psychological object
and is described both internally and externally in dimensions such as good-bad, likeable-dislikeable, harmful-beneficial, pleasant-unpleasant (Ajzen & Fishbein, 2000; Eagly & Chaiken, 1993). Various researches have been carried out to see the role and attitude of teachers towards integrated technology in classroom. Many reveal positive attitude of teachers: however some also emphasize that teachers lack the necessary ITE knowledge and skills. Zhao, Tan and Mishra suggested that the attitudes of teachers are directly related to computer use in classroom. PISA (2007) stated that current technology offers many sophisticated and simple enhancements to the teaching and learning of mathematics. Gaps in mathematical understanding, however, reveal the inability of students to articulate, communicate, or reason mathematically.

2. Justification of problem

The conventional way of teaching and learning has been completely changed by introducing enormous use of technology in the field of education. The best use of resources can be effectively used if most of teachers and students should understand adequately the dynamics and mechanism of educational technology so as to provide the best possible education to the students. In present time digital technologies tailored around teachers to increase pedagogies and ensure uniform quality of teaching is needed everywhere. Especially all-inclusive edutech platforms to provide good quality content channelize communication and collaboration between students and teachers to improve teaching methods.

Technology becomes important when teachers use it in learning-teaching process. However, some people are also of view that technology in the teaching-learning process brings pressure so effective use is required. (Kozma, 2003), concluded that teachers’ attitudes and levels of knowledge are major factors for effective usage of technology. The results of study demonstrate that an individual’s attitudes have a significant impact on his/her behaviour in ICT use. In other words, teachers’ attitudes, whether positive or negative, affect how they respond to and use ICT. Therefore, information is required about teachers’ attitudes for plans about and future investments in ICT.

Though numbers of researches have been carried out to study the attitude towards integrated technology like whiteboard, ICT, etc., yet technological advancement and increased use of this in our classroom demands to peep into the attitude of teachers towards their increasing role. Current study is carried out to understand teachers’ attitudes and also to examine the factors that encourage or impede teachers from integrating technology. This study investigates instructors’ attitudes and influence of other factors toward adapting technology in educational practice.

3. Review of related literature

Singh, K.S. (2012) studied teachers’ attitude towards ICT among teacher training institutes of Manipur state in India. Teachers of five training colleges affiliated to Manipur University constituted for sample of the study. The study revealed that there is significant difference between arts and science teachers’ attitude towards use of ICT. Science teachers show more interest than arts teachers.

According to Pearson Voice of Teacher Survey (2015), some of the major challenges faced by teachers are lack of training support, lack of trained staff to maintain technological equipments along with facing difficulties in use of technology in the classroom. Sample was taken from schools of all India including government and private schools. A sample consisted of 4722 teachers out of which 1055 was government while 3667 was private teachers. Only 44% teachers believe the technology adoption extremely important. The study revealed various barriers to adoption of technology such as high cost of installation, lack of structure and staff, lack of training to teachers.

Basu, N. & Gawher, A. (2016) conducted a study to compare the attitude of higher secondary schools teachers towards ICT. The sample for the proposed study consisted of 60 higher secondary school teachers Private N= 30; Science N= 15; Arts = N=15) belonged to different areas of Zone Dreygam District Budgam. The study revealed that highest percentage i.e. 30% Govt. higher secondary school teachers have favorable attitude and 30% private higher secondary school teachers have unfavorable attitude towards using the new technology. It was found that highest percentage i.e. 33.33% science higher secondary school teachers have favorable attitude and 26.70% arts higher secondary school teachers have neutral attitude towards using new technology.

Despite the positive attitude found in the studies of Lal Chavvi, Kandaswamy, Perilah & Shah, lack of training and availability has been found in schools. The frequency and rate of usage also vary from equipment and resources. Surveys by Central square foundation (2015), Pearsons Voice of teachers (2015), reported lack of training and difficulty in maintenance. Moreover, the research by Nighat Basu & Gawher Ahmad (2016) indicated difference between the rate of interest among science and arts teachers. Thus, the studies indicate that more research is required in this field to understand the attitude of teachers and to take necessary measures in this smart teaching era.

4. Objectives of the study:

The specific objectives are: To compare the attitude of secondary school teachers towards integrated technology in education on the basis of

1) Academic Stream (Science & Humanities)
2) Types of Schools (Government & Private)

5. Hypotheses of the study

H-1: There exists no significant difference of attitude towards the integrated technology in education among secondary school science teachers on the basis of types of schools.

H-2: There exists no significant difference of attitude towards the integrated technology in education among
secondary school humanities teachers on the basis of types of schools.

H-3: There exists no significant difference of attitude towards the integrated technology in education among government schools’ science and humanities teachers.

H-4: There exists no significant difference of attitude towards the integrated technology in education among private schools’ science and humanities teachers.

6. Research design

In the present study cluster random sampling procedure was adopted for the selection of the sample. For the selection of (200) teachers, all the present teachers in school were selected from the ten schools. Equal number of humanities and science teacher from government and private schools has been included in the sample. The Standardized tool of ‘Attitude towards ICT Scale developed by Mehra & Far (2013) was used for collection of data.

7. Analysis and interpretation

H-1: Attitude towards the integrated technology in education among secondary school science teachers on the basis of types of schools

<table>
<thead>
<tr>
<th>Category</th>
<th>Group</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>t – Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Science</td>
<td>Private</td>
<td>50</td>
<td>235.66</td>
<td>16.19</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Government</td>
<td>50</td>
<td>204.14</td>
<td>14.76</td>
<td>10.16**</td>
</tr>
</tbody>
</table>

**=Significant at 0.01 level

The t-value is highly significant at 0.01 level of confidence. So the hypothesis “There is no significant difference of attitude towards the integrated technology in education among secondary school science teachers on the basis of type of school” is rejected. It indicates that the significant difference exists in science teachers on the basis of their type of school. Private school Teachers showed more favourable attitude. The reason could be commercialization or socioeconomic status. As Warschauer, M. (2007) has mentioned in his study that in private schools with a higher socioeconomic status usage of integrated technology is more because teachers are confident that students have better access to computers and/or technology at home also.

Graph 1.1-Showing Difference of Mean Scores of Attitude Towards Integrated Technology among Secondary School Science Teachers on the basis of Types of Schools

From graph 1.1, it is evident that the mean scores of Private Secondary School Science Teachers (M=235.66) is greater than the Government Secondary School Science Teachers (M=204.14) in attitude towards ITE. It means that Secondary School Science Teachers of Private schools show more positive attitude than the Secondary School Science Teachers of Government schools.

H-2: Attitude towards the integrated technology in education among secondary school Humanities teachers on the basis of types of schools

<table>
<thead>
<tr>
<th>Category</th>
<th>Group</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>t – Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Humanities</td>
<td>Private</td>
<td>50</td>
<td>223.36</td>
<td>22.344</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Government</td>
<td>50</td>
<td>199.38</td>
<td>10.767</td>
<td>6.820**</td>
</tr>
</tbody>
</table>

**=Significant at 0.01 level

The t-value came out to be 6.820, which is highly significant at 0.05 level of confidence. Consequently, the hypothesis i.e. “There is no significant difference of attitude towards the integrated technology in education among secondary school humanities teachers on basis of types of
“schools” is rejected. It indicates that the significant difference exists in secondary school teachers on the basis of their type of school.

This result goes with the same as found by Zhao, Tan and Mishra (2001) in which they found that more the teacher use and aware about its use, more will he use it in the classroom. From this study it is clear that the attitudes of teachers are directly related to computer use in the classroom.

Graph 2.1- Showing Difference of Mean Scores of Attitude Towards Integrated Technology among Secondary School Humanities Teachers on the basis of Types of Schools

From graph 2.1, it is evident that the mean scores of Private Secondary School Humanities Teachers (M=223.36) is greater than the Government Secondary School Humanities Teachers (M=199.38) in attitude towards ITE. It means that Secondary School Humanities Teachers of Private schools show more positive attitude than the Secondary School Humanities Teachers of Government schools.

H-3: Comparison of attitude towards the integrated technology in education among government schools’ Science and Humanities teachers

Table 3: Summary of attitude towards technology in education of Science and Humanities teachers for govt. schools.

<table>
<thead>
<tr>
<th>Category</th>
<th>Group</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>t – Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic Stream</td>
<td>Science</td>
<td>50</td>
<td>204.140</td>
<td>14.767</td>
<td>1.849</td>
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<tr>
<td></td>
<td>Humanities</td>
<td>50</td>
<td>199.36</td>
<td>10.767</td>
<td></td>
</tr>
</tbody>
</table>

*=Significant at 0.05 level

The t-value came out to be 1.849, which is not significant at 0.05 level of confidence. Hence, the hypothesis i.e. “There is no significant difference of attitude towards the integrated technology in education among government schools’ science and humanities teachers” is not rejected. It indicates that no significant difference exists in science and humanities teachers of govt schools.

H-4: Comparison of attitude towards the integrated technology in education among Private schools’ Science and Humanities teachers.

Table 4: Summary of attitude towards technology in education of Science and Humanities teachers for Private schools.

<table>
<thead>
<tr>
<th>Category</th>
<th>Group</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>t – Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic Stream</td>
<td>Science</td>
<td>50</td>
<td>235.66</td>
<td>16.198</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Humanities</td>
<td>50</td>
<td>223.36</td>
<td>22.434</td>
<td>3.143**</td>
</tr>
</tbody>
</table>

*=Significant at 0.01 level

The t-value came out to be 3.143, which is highly significant at 0.01 level of confidence. Therefore, the hypothesis i.e. “There is no significant difference of attitude towards the integrated technology in education among science and humanities teachers of private school” is rejected. It indicates that the significant difference exists in science and humanities teachers of private schools.

This result is supported by the results found in study of Gray and Souters (2002) carried out a study to examine the use of ICT in secondary subject areas, and the perceptions of teachers in these areas. Result shows that relative to other subjects teachers, science teachers are more positive with to use of and confidence in education technology. Pan, A. (2014) also found the similar results that science teachers have better attitudes in using technologies than their counterparts.
From graph 4.1, it is evident that the mean scores of Private Secondary School Science Teachers (M=235.66) is greater than the Humanities Teachers (M=223.36) in attitude towards ITE. It means that Private Secondary School Science Teachers show more positive attitude than the Humanities Teachers.

8. Conclusion

1. No significant difference of attitude towards the integrated technology in education among government schools’ science and humanities teachers.
2. A significant difference of attitude towards the integrated technology in education among private schools’ science and humanities teachers.
   - Science teachers have more availability of resources and materials as more and more visual aids have been developed in science stream.
   - Humanities teachers may use more creative techniques and drills for concept attainment.

9. Educational implications

   Teachers’ requirements should be considered while developing educational software and visual aids so that they use these ITE tools which will develop a positive attitude towards ICT.
   - Along with science, humanities teachers should also encourage and motivate for the use of ITE.
   - In Language Teaching, the use of technology should be promoted as it enhances Listening, Reading, and comprehension ability in students.
   - The area of technology in education should also enhance for various subjects of humanities by creating awareness and developing softwares.

References