Development of an Attitude Scale to Measure Educational Technology Application of Teacher Educators

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Paper Received on: 14/01/2014
Paper Reviewed on: 16/01/2014
Paper Accepted on: 22/01/2014

Abstract

This paper explains the procedure of developing and standardizing a scale constructed by the authors to measure the attitude towards Educational Technology Application of teacher educators. The scale has been constructed by using likert’s method of summation to obtain a six point judgment on each item after critical study related to Application of Educational Technology, three dimensions namely Hardware, Software, Systems Approach were selected for constructing the tool. The pilot study had 71 items, related to all the three dimensions mentioned above. The newly constructed scale had face validity, content and construct validity, and reliability.

Key words: Attitude, Educational Technology Application and Teacher-Educators.

Introduction: ICT already changed the way of communications and doing daily tasks in a large number of fields such as education, as ICT significantly changed the way of teaching and learning and the roles played by both teaching staff and students. Moreover, ICT has become an important part of most organizations and businesses these days (Zhang and Aikman, 2007). Also, Dawes (2001) believes that ICT has the power to support teaching and learning, and provide new enhanced approaches for doing the required tasks in ways that have not been possible before.

The excess of studies conducted on teacher characteristics including perceptions, beliefs and attitudes indicate the primacy of understanding what drives teachers to integrate technology in their teaching. In contemporary society, issues related with providing sound technology
infrastructure in schools have almost faded out as the costs have become more affordable in recent years with policy makers attending to these issues more closely. There are certain factors that affect ICT Use; these factors could be listed as follows, in accordance with related research in the literature: ICT attitudes, knowledge (Jeong & Lambert, 2002; Teo, Chai, Hug & Lee, 2008; Tezci, E. (2010), Individual characteristics (Gender, Age, Years of teaching experience) (Durndell, & Thomson, 1997; Hartley & Bendixen, 2001), Self-efficacy (Karsten & Roth, 1998), Anxiety (Igbaria, Parasuaman, & Baroudi, 1996), Culture (Albirini, 2006; Li & Kirkup, 2007), Beliefs (Lim & Chan, 2007; Teo, Chai, Hug & Lee, 2008), Experience of ICT use (Anderson, 2006; İşman, Evirgen & Çengel, 2008), Learning and teaching approach (Niederhauser & Stoddart, 2001; Teo, Chai, Hug & Lee, 2008b), Access to technology and attitudes (Hong & Koh, 2002).

In a study by Jennings and Onwuegbuzie (2001), they declared that younger teaching staff was found to have more positive attitudes towards the use of ICT. Also in the same context, Oscarson (1976) discovered that age is in a positive relationship with the attitude towards technologies, where older teaching staff were more adoption prone than younger teaching staff. Woodrow (1992) found that successful transformation in educational practice requires the development of positive attitudes towards new technology. Therefore, it can be concluded that the frequency and effectiveness of ICT usage in the classroom is largely related to educators’ attitude.

There are many factors that influence achieving a meaningful use of computer technology in the field of education, and educators’ attitudes towards the use of technology in the teaching process is one of these factors. Research shows that the success of technology use in education mostly depends on educators’ attitudes towards technology use (Albirini, 2006, Kluever, Lam, Hoffman, Green & Swearinges, 1994) and it is considered as an important element in predicting the use of technologies in educational settings (Albirini, 2006). Recent studies have shown that educators, who actually determine how technologies are used in the classroom, play an important role in the successful integration of educational technologies (Kagima, 1998).

Since the mid 1980s information and communication technology has been introduced to many education systems throughout the world. An observation from earlier international assessment of IEA (OECD 2006) as well as many national assessments (Brecker 1994) was that the infusion of ICT in the daily learning practices of students was progressing very slowly and sometimes even stagnating for policy makers who have invested huge budget in making ICT available for schools, major questions are why the progress is so slow and which barriers have to
be removed in order to stimulate teachers to use new technologies in their educational practices in implementation of educational changes (Marcinkiewicz, 1993). The implementation of ICT can be seen as a complex innovation mainly because the use of ICT is not only the introducing of a new tool in education. The integration of ICT in educational practice has the potential to facilitate new pedagogical approaches, learner centered educational practice in particular (Dede 2000), and different learning outcomes such as lifelong learning competencies are considered important lifelong learning outcomes in the 21st century (Anderson, 2008). Hence the authors decided to construct an attitude scale to measure Educational technology Application, so that the newly constructed scale contains all the factors pertaining to Attitudes Educational technology Application of Teacher-Educators.

**Methodology:** Normative Survey was employed for the study.

**Sample:** For the pilot study the sample consisted of 50 teachers educators of Bijapur and Belagavi District Karnataka state, India selected through simple random technique.

**Instrument:** The first part of the scale is captioned by general information which includes the variables like gender, subject handling, and type of College. The second part of the scale was formed after reviewing many related studies done in the field of Education technology usage in teaching-learning process, Evaluation and Administration in schools and colleges both in India and in other countries and following dimensions were selected.

1) Hardware – Teachers knowledge and skill related to application of hardware in teaching provides adequate opportunities for professional achievement and advancement related to hardware application in teaching. The inadequate knowledge and skill make cultivate negative outlook towards hardware using in the teaching process. Hence statement regarding this dimension were added in this tool.

2) Software – teacher educator knowledge, skills and competency to use software in the classroom situation influences their outlook. Adequate knowledge about software on the part of teacher educators will cultivate positive outlook towards software application. Hence, statement regarding this dimension were added in this tool.

3) Systems approach – the application of educational technology in education field becomes incomplete without systems approach. Therefore, it is necessary that teacher educators should possess adequate knowledge about systems approach to education. Hence statements regarding this dimension were added in this tool.
After a careful scrutiny of the statements by the experts, 71 statements (62 favourable and 9 unfavourable) statements were selected for pilot study.

**Pilot Study:** After constructing the Educational Technology Attitude Scale, a pilot test was conducted on a random sample of 50 teacher educators in Bijapur, Belagavi districts, Karnataka state, India. The test was conducted with a view to find out the reliability and validity of the tools and also to eliminate and ambiguity so that teacher educators do not have any difficulty in responding to the items in the Educational Technology Attitude Scale. Scoring was done on the Six point scale. Total score for each subject was calculated, the sum of the item credits represents the individual total score.

**Scoring Procedure:** Six points was constructed. The scale values in this scale were Strongly Agree (SA), Moderately Agree (MA) slightly agree (SA), Slightly Disagree (SD) Moderately Disagree (MD), Strongly Disagree (SD). Against each statement the above mentioned 6 alternative responses were given. Weights of 6,5,4,3,2 & 1 were given for favourable statements in the order of their favourableness, and for unfavourable statements, scoring system is reversed. Thus, if one chooses strongly agree response for favourable statements he/she gets ascore of 6 and for same response, if the statement is unfavourable one gets a score of 1.

In this scale there is no provision for undecided response or neutral response. An individual’s score in this scale is the sum total of the scores for all the statement by the subject (summated ratings)

**Item Analysis:** Cronbach’s Alpha was used to assess the degree of internal consistency among all sets of items, and then the task value was calculated. Items with ‘r’ values less than 0.30 were rejected, According to (De Vaus 2004), anything less them 0.30 is a weak correlation for item analysis purposes. As many as 62 statements having the ‘r’ value greater than 0.30 were chosen, in order to form the final scale. An individual’s score in this scale is sum total of the scores for all the statement by the subject (Summated Ratings). The higher the score in this scale grater will be the attitude towards Educational technology.

**Table-1.Educational Technology Application Attitude Item: Total Reliability Statistics**

<table>
<thead>
<tr>
<th>Cronbach’s Alpha</th>
<th>No, of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>.965</td>
<td>62</td>
</tr>
</tbody>
</table>

The above Table-1 Shows the Cronbach’s alpha reliability score 0.965 for total items in Attitude towards Education technology Application tool.
Table-2. Dimension-Total Statistics

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Cronbach’s Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Hardware</td>
<td>.868</td>
</tr>
<tr>
<td>2. Software</td>
<td>.897</td>
</tr>
<tr>
<td>3. System Approach</td>
<td>.879</td>
</tr>
</tbody>
</table>

The above Table -2 Shows dimension wise Cronbach’s alpha reliability scores.

Reliability and Validity: The scale had the universe of content as it included statements from all the selected domains of Educational technology application, namely Hardware, Software and Systems approach. Due weightage was given to all the domains while selecting items. The scale had 62 items representing the universe of content, hence it had face validity. It also had construct validity as items were selected having the ‘r’ values more than 0.30 (De Vaus 2004), the scale was given to experts in the field of education and they agreed that the items in the scale were relevant to the objective of the study hence it had also content validity. The reliability test was found to be 0.965, for Hardwares, 0.8689 for Software 0.897 and System approach 0.879. hence the final tool comprises 60 positive items and 2 Negative items.

Conclusion: The scale to measure Educational technology developed and standardized by the authors can be used to study the attitude of Educational technology application of teacher educators to find out and analyze various factors associated, so that necessary steps can be taken to create environment in which the emphasis can be given to enhance the usage of the ICT by teachers in their teaching and learning process.

References:


