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RESEARCH ARTICLE

CONSTRUCTION AND STANDARDIZATION OF ATTITUDE SCALE TOWARDS TECHNOLOGY

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Abstract

Education is at the confluence of powerful and rapidly shifting educational, technological and political forces that will shape the structure of educational systems across the globe for the remainder of this century.Technology can help facilitate the knowledge-constructed classroom. But there are many factors affecting the successful integration of technology into classroom teaching. These factors are associated with teaching-learning process, nature of content, attitude of teachers as well as of students. Present paper discusses the procedure of construction of attitude scale towards technology.

Introduction:-

Attitudes are one of the most studied aspects of social functioning. An attitude is a mental and neural state of readiness, organized through experience, exerting a directive or dynamic influence upon the individual's response to all objects and situations to which it is related (Allport, 1954). In the literature, three accepted concepts generated from the term attitude are: cognitive (a person's knowledge about an attitudinal object), affective (a person's feelings about an attitudinal object), and behavioral (a person's action towards the attitudinal object in a certain way). According to Fisbien and Ajzen (1975), attitude is an important concept that is often used to understand and predict people's reaction to an object or change and how behavior can be influenced.

Attitudes can be considered both the determinants and consequences of learning experiences (Davies and Brember, 2001). Learning experience may be influenced by factors such as self-concept, parents, teachers, environment, socio-economic status, objects, and situations. Technology impacts students' daily lives and certainly plays an important part in developing students' positive and negative attitudes toward it. As a direct means, technology may help develop attitudes through students' experience with cars, computers, or even when they attempted to ride a bicycle for the first time. Vicariously, technology may form attitudes through less obvious means such as mass media and advertising campaigns.

Technological tools are also used in the field of education. Therefore, there has been a need for determining the student attitudes towards the technological tools that are used in education. At Florida College University, in 1997, at the beginning and end of the computers in technology education classes, variables of the effects of the pre-service teachers' attitudes towards studying and learning on computers were investigated. The variables in this study were attitude towards computers, computer anxiety, confidence in computer, computer tendency, and computer usefulness and student perceptions. At the end of the class, the scale of attitude towards computers was administered to 22 students as pre and posttests. It was found at the end that the students' attitudes turned out to be more confident and positive after the lessons were completed (Gunter, Gunter and Wiens, 1998).

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Educators have developed various scales in order to assess the attitudes of the students towards the Internet. Becker and Maunsaiyat (2002) examined the technological concepts and attitudes of Thai students of 12-15-year-old secondary school students near Bangkok. It was also examined by Thai teachers and found to be useful for the secondary school Thai students with respect to program planning, curriculum development and application. Differences were found between the American and Thai students in their technological attitudes. These differences were thought to stem from the differences between the educational systems and cultures and the teacher-centered method used by the Thai teachers.

In a study where the attitudes of children towards technology were analyzed, a scale was developed after the oral research and was administered to 574 students. At the end of the analysis a scale with two factors was created: interests/aptitudes and alternative preferences. The scores of primary and secondary school children for these two subscales were compared and significant differences were found. Additionally, attitude differed according to the gender (Frantom, Green and Hoffman, 2002). In a study where the students' attitudes towards the Internet was assessed, 173 students were randomly chosen among the 2003 fall students of East Mediterranean University and were administered a 5-point Likert type scale consisting of 30 items, 7 of which were about personal details and 23 of which were about attitudes towards the Internet. According to the results, the students who had computers at home thought that the friendships establish on the Internet were temporary and the contents in foreign languages did not make an obstacle, in opposition to the ones who did not have computers at home (İşman and Dabaj, 2004).

People of varying backgrounds often have different belief and value systems which give rise to dissimilar attitudes (Rathus and Nevid 1987). Beliefs and values form a basis of attitudes towards technology. Therefore varying backgrounds and belief systems contribute to an individual's attitude towards a technology.Studies confirm a relationship between the perception of usefulness of computers to perform job tasks and the level of usage (Koohang,1987; Gardner, Dukes and Discenza 1993; Sacks, Bellisimo and Mergendoller,1993) In addition, all studies identified a positive correlation between favorable attitudes toward computers and computer familiarity. Allowing individuals to become familiar with the technology and the perception of usefulness were noted as a critical contributors to successful adoption of the technology.

Attitudes towards computers differ between the genders. Males tend to display more positives attitudes toward computers, regardless of the level of familiarity, while female attitudes become more positive as the level of familiarity increases (Sacks, BellisimoandMergendoller, 1993). Arthur, Winfred and Hart (1990) identified a positive relationship between cognitive ability and computer familiarity. The authors suggest that individuals with low cognitive ability levels may consciously opt not to become familiar with computer due to the challenging nature of the technology.

Abouserie and Moss (1992) investigated 143 undergraduate freshman students' attitudes toward computer-assisted learning (CAL). They examined the relationship between students' attitude toward using CAL and their cognitive style (field dependent and field independent FD/FI) as they relate to gender. They found a significant correlation between students' attitudes and their field dependency. The findings showed that male students preferred using CAL more than female students did. In addition, FD students relied more on CAL than FI students did.

Gardner, Morrison and Jarman (1993) identified a positive correlation between experiences with computers and beliefs towards them. Not surprisingly, negative experiences with computers correlated with negative beliefs and attitudes toward the technology. Individuals that had positive experiences also exposed positive beliefs and attitudes. Personal experience plays a strong role in forming an individual's attitude. Its no wonder that experience also influence attitudes towards technology.

Altun and Cakan (2006) also investigated the relationship between attitudes towards computers and cognitive styles by using Group Embedded Figures Test, with 67 undergraduate university students. The results indicated small but not significant correlations (between r= -.006 and r= .309) between these variables.

Justification of the Study

Education is at the confluence of powerful and rapidly shifting educational, technological and political forces that will shape the structure of educational systems across the globe for the remainder of this century. Many countries are engaged in a number of efforts to effect changes in the teaching/learning process to prepare students for information and technology based society. The UNESCO World Education Report (1998) notes that the new technologies

challenge traditional conceptions of both teaching and learning and, by reconfiguring how teachers and learners gain access to knowledge, have the potential to transform teaching and learning processes.The successful integration of technology into classrooms has been a goal for generations of instructional technology researchers and practitioners (Cuban, 1986).In the student-centered classrooms of today, with the aid of the computer, students are able to collaborate, to use critical thinking, and to find alternatives to solutions of problems (Jaber, 1997). Technology can help facilitate the knowledge-constructed classroom. But there are many factors affecting the successful integration of technology into classroom teaching. These factors are associated with teaching-learning process, nature of content, attitude of teachers as well as of students. Therefore, a scale has been constructed and standardized to assess the attitude of students towards technology.

Objective of the Study:-

- To construct and standardize the attitude scale towards technology.

Methodology:-

The attitude scale towards technology was developed and standardized by the investigator to study the students' attitude towards technology. Likert method was followed to construct the attitude scale. The steps followed in the construction and validation of attitude scale i.e. Planning, Designing, Tryout, Construction are discussed below.

Planning

The researcher consulted the literature available on the related topic and hold discussions with the subject experts and students to collect the items for the attitude scale. After due consultations and reviewing the recent literature, the following seven domains were selected by the researcher for the attitude towards technology scale.

- Knowledge
- Liking
- Anxiety
- Self Efficacy
- Usefulness (General)
- Usefulness (Educational)
- Enthusiasm

Designing

In the present scale initially 75 items were written by the investigator covering each of the seven domains, viz. knowledge, liking, anxiety, self-efficacy, usefulness (general), usefulness (educational) and enthusiasm. Each statement was followed by five levels of agreement ranging from Strongly Agree to Strongly Disagree.

Tryout

The scale of attitude towards technology was administered on the sample of 100 students from two schools i.e. Senior Scholars School, Pathankot and St. Thomas Senior Secondary School, Pathankot. The response sheets were collected and scored for each individual separately.

Construction

After try out the items of the scale were reviewed by the investigator and the items which were ambiguous, double barreled, double negative and repetitive were dropped. Finally 50 items were retained in the scale. The details of the number of items retained in each dimensions as well as that of the positive and negative items have been given in the following tables.

Table 1:- Distribution of Items of Attitude Scale towards Technology in Each Domain.

Domain	Sr. No. of Statements on the Scale	Total No.of Items
Knowledge	4, 6, 16, 20, 22	5
Liking	14, 18, 26, 31, 37, 49	6
Anxiety	1, 13, 35, 46, 48	5
Self-Efficacy	10, 24, 28, 33, 40	5
Usefulness (General)	3,11, 15, 19, 27, 30, 41, 43	8

Usefulness (Educational)	2, 5, 8, 17, 21, 23, 25, 29, 32, 34, 36, 38, 42, 45, 4 45, 47, 50	16
Enthusiasm	7, 9, 12, 39, 44	5
Total		**50**

Table 2:- Details of Positive and Negative Statements in Attitude Scale towards Technology.

Statement	**Sr. No. in the Scale**	**Total Items**
Positive	1, 2, 3, 4, 5, 7, 9, 10, 13, 14, 15, 17, 21, 22, 28, 29, 30, 32, 37, 38, 39, 40, 41, 42, 45, 47, 48, 50	28
Negative	6, 8, 11, 12, 16, 18, 19, 20, 23, 24, 25, 26, 27, 31, 33, 34, 35, 36, 43, 44, 46, 49	22
	Total	**50**

Scoring

Scoringwas based on a fivepoint Likert type scale. A positive item weighed score of 5 for Strongly Agree (SA), 4 for Agree (A), 3 for Undecided (U), 2 for Disagree (D) and 1 or Strongly Disagree (SD) and a negative item weighed score of 1 for Strongly Agree (SA), 2 for Agree (A), 3 for Undecided (U), 4 for Disagree (D) and 5 for Strongly Disagree (SD). The maximum score of the scale could be 250.

Establishing Reliability and Validity

- **Reliability**

The reliability of the attitude scale was formed by using the Test-Retest method. The attitude scale was administered to the same group after the gap of 20 days and the correlation between the two tests was found out to be 0.85 indicating the test to be reliable. The following formula was used to compute correlation:

$$r = \frac{\sum xy}{\sqrt{\sum x^2 \Sigma y^2}}$$

where;

r = reliability coefficient

x = deviation from Actual mean of X

y = deviation from Actual mean of Y

- **Validity**

For the present study the content validity of the attitude scalewas demonstrated. To determine the content validity, the test items and the list of the outcomes were given to the subject experts to review the test items and comment on whether each item approximately matched to the content area specified. As the table of specifications and items were found to match adequately, the content validity of the attitude scale was ascertained.

Conclusion:-

The present study has wide educational implications as the integration of technology in the teaching-learning process is the key feature of present education system. The whole process of teaching and learning has transformed from conventional to technology based. The New Educational Policy (NEP) 2020 has also emphasized the use of technology in education to help students acquire and construct knowledge by their own rather than rote learning. For technology to be a key element in the teaching-learning process, the teachers and students must have a favourable attitude towards its use. Therefore, measuring their attitude towards technology and to make necessary alterations in it , if needed, is the fundamental step to create a conducive environment for technology based classroom.

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