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FACTORIAL STUDY OF STUDENTS ATTITUDE TOWARDS TECHNOLOGY ENABLED ACADEMIC LEARNING

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ABSTRACT

An attempt was made to develop a comprehensive scale for measuring students' attitude towards Technology Enabled Learning. A sample of 50 students whose age ranged between 19 – 21 was administered with 50 – items of the students' attitude towards Technology Enabled Learning. Results of the factor analysis show the outcome of five independent factors. They were labelled as: Self- Efficacy, Classroom Learning, Attitude Towards Technology, Learning Feasibility and Academic Achievement. Both Face and Content validities were established with the opinions of the experts in the field of investigation.

KEYWORDS

Classroom Technology, Learner Attitude, Educational Purposes, Academic Achievement.

INTRODUCTION

Attitudes can be considered both the determinants and consequences of learning experiences (Davies and Brember, 2001). Learning experience may be influenced by individuals, self-concept, parents and teachers' motivation, Learning environment, socio-economic status, objects, and situations (Coon, 1995; Weiner, 1994). Although these experiences may be satisfying or frustrating, attitudes are nevertheless developed, and once established, they enable or inhibit further learning opportunities. Technology impacts students' daily lives and certainly plays an important part in developing students' positive and negative attitudes toward it.

Recent technological advancements have provided educators and learners with new tools to support in-class instruction and coursework. Hence, integrating technology into classrooms is a growing initiative that is becoming an important and growing part of educational culture and university life (Bratina, Hayes, & Blumsack, 2002; Wiley 2001).

Classroom Technology is the collection of software, hardware and processes that facilitate learning (and teaching) and thus impact (mostly positively) the learner's attitude and performance (Govindasamy 2002; Khan 2000). Similarly, learner attitude is defined as the impact or influence of classroom technology on a student's disposition towards learning and this can be positive, negative, or neutral.

The introduction of technology to the learning environment has presented many opportunities and challenges for both students and educators alike. Bena and James (2001) claim that there are three reasons for investing in technology: (1) to increase students ability and interest in applying authentic settings, what district and states have identified as learning and tasks that students should know and able to do; (2) to prepare students for success in a technology centered world of work, and; (3) to prepare students to manage and use information so they can be productive life long learners and responsible citizens. Furthermore, integrating technologies in learning classrooms has been shown to promote teachers and students' performance and motivation.

According to a number of academics in the educational technologies field, through the implementation of educational technology student attitude tends to improve and the students are also better prepared to enter and succeed in the digital workplace (Chen, Lee, & Chen, 2005; Liaw, 2004). In the present study, an attempt was made to develop a comprehensive scale for measuring the effect of students' attitude towards Technology Enabled Academic Learning.

OBJECTIVES

1. To identify the various factors related to students' attitude towards Technology enabled academic learning.
2. To devise a reliable and valid scale for the use with students of Hotel Management and Catering Technology.

Review of literature reveals in the related area the availability of a few instruments but none was found to be adequate as they were standardised in the other countries. Hence, the need was felt by the investigator to develop a comprehensive scale to measure students' attitude towards Technology Enabled Academic Learning.

METHOD**SAMPLE**

The sample of the study comprised of 200 Degree students. Their age ranged from 19 – 21 years, studying in the first year B.Sc H&HA Degree. 50 subjects were selected by simple random sampling method for the present investigation.

DESCRIPTION OF TOOL

Students' Attitude towards Technology Enabled Academic Learning scale emerged out of an exhaustive survey of literature and suggestions made by educationists, management specialist's faculty members and students of Hotel Management course. It is a 5- point scale varying from the response of "Strongly Agree" to "Strongly Disagree". The raw scores of "5" to "1" were given and later the factor scoring method was adopted for the statistical analysis of the data. The items in the scale cover students various attitude towards technology used in the classroom for their academic learning.

FACTORIAL METHOD

The raw data from the study sample (N= 50) was computerised for factor analysis by the method of Principle Factoring Orthogonal Rotation: Varimax with 40- interactions (Kim, 1970). It involves 3 steps:

1. Preparation of the correlation matrix.
2. Extraction of the initial factors – the exploration of possible data reduction and
3. The rotation to a terminal solution - the search for simple and interpretable factors.

The factor analytic report of the scale consists of 5 factors which were labelled according to experts' suggestions. The final form of the scale consists of 50- items, after deleting 10-items which are below 0.50 in factor loading. The labelled factors were: Self-Efficacy, Classroom Learning, Attitude Towards

Technology, Learning Feasibility and Academic Achievement. To obtain the reliability measure, the internal consistency method was adopted which was done through the Factor Analysis. Moreover, the face validity and content validity were established by the opinions of the experts on labelling of these factors.

RESULTS AND DISCUSSION

The results of the Factorial Analysis showed that all the items were positively loaded with each other. These items were arranged in order of hierarchy and factor loading of 0.50 was taken into consideration for the each factor interpretation.

TABLE – 1: FACTOR I – SELF-EFFICACY

S.NO	ITEM.NO	STATEMENT	FACTOR LOADING
1	1	I am interested to learn new things through technology.	0.78
2	2	I have good knowledge in Computer Application.	0.77
3	3	Technology helps me to control my pace of learning.	0.76
4	4	Classroom Technologies help me to stimulate my problem solving skills through visual experiences.	0.76
5	5	Technology helps me to learn better now-a-days.	0.74
6	6	Technology helps to understand and retain the information on subject matter.	0.73
7	7	Technology motivates me in further learning.	0.70
8	8	I wish to be more attentive when Technology is used in the classroom.	0.69
9	9	Technology conveys theoretical concepts with practice for more understanding.	0.67
10	10	Technology enables me to be more creative.	0.65
11	11	Technology will change the way students learn in the class	0.65
12	12	Technology helps me to learn because it allows to express thinking in better and different ways.	0.63
13	13	Technology is used for self - evaluation.	0.61
14	14	I have good knowledge in using computers.	0.59

FACTOR I: SELF-EFFICACY

It is observed from the Table – 1 that the first factor contains 14 – items of which 7 items are fairly high loaded ($r = 0.70 - 0.78$) and rest 7-items are moderately loaded ($r = 0.59 - 0.69$). The 30-items contribute to the variance of 30.1%. The items in the factor of Self-Efficacy were expressed as: students learn new things through technology, good knowledge in computer application, technology helps students to control pace of learning, technology helps students to learn better, it motivates students further learning, etc., Hence the factor is labelled as “Self-Efficacy”.

TABLE – 2: FACTOR II – CLASSROOM LEARNING

S.NO	ITEM.NO	ITEM CONTENT	FACTOR LOADING
1	15	Classroom technologies help me in getting pro-actively involved with learning.	0.73
2	16	Working with technology creates academic interest among the learners.	0.72
3	17	Technology helps me to learn more than books	0.70
4	18	Students are more interactive with others when using technology.	0.69
5	19	Working with technology is more of time consuming and worthwhile.	0.68
6	20	Technology promotes active learning and avoids boredom, monotony, etc.,	0.65
7	21	Working with technology is quite safe when one can understand properly.	0.63
8	22	As per my opinion, everyone needs technology while learning.	0.62
9	23	Students learning capacity improves since the implementation of classroom technologies.	0.60
10	24	Technology improves the level of student's competency.	0.55
11.	25	Teacher serves to be the facilitator while using Technology	0.52

FACTOR II: CLASSROOM LEARNING

The items in the “Classroom Learning” Table-2 shows that the 3– items are highly loaded ($r = 0.70 - 0.73$) and 6 items are moderately loaded ($r = 0.55 - 0.69$) and also its found that 2- items are found in the correlation value of 0.52 and 0.55. The Table – 2 reveals 20.4% of variable accounted for factor 2. This factor is defined as “Classroom Learning”. Since most of the items in this factor are pertinent to students classroom learning through technology usage by the teachers in the classroom learning, the factor infers that working with technology creates academic interests among the learner, which helps to learn more than mere reading the books, though its of more time consuming and its worthwhile, etc.,

TABLE – 3: FACTOR III: ATTITUDE TOWARDS TECHNOLOGY

S.NO	ITEM.NO	ITEM CONTENT	FACTOR LOADING
1	26	Students must receive any support they need in order to use technology.	0.71
2	27	The use of technology provides richer experiences to the students.	0.70
3	28	Technology in the classroom is highly helpful in making classroom support assignment.	0.68
4	29	The use of technology improves the quality of communication.	0.65
5	30	Technologies may substitute class lectures for creating interest.	0.62
6	31	Using technology, students can interact with teacher by e-mail	0.62
7	32	Technology can improve the quality of education.	0.60
8	33	The use of technologies makes the course work as an interesting activity.	0.59
9	34	Technology increases learning skills.	0.55
10	35	When students use computer to do their assignments, the presentation is better in qualitywise.	0.52

FACTOR III: ATTITUDE TOWARDS TECHNOLOGY

It is obvious from the Table – 3 that first 2-items are highly loaded ($r = 0.70$ & 0.71) and rest are moderately loaded ($r = 0.52 - 0.68$). The 10-items of the factor contribute to 18.4% of variance. The labelling of the factor reveals that the students receive any support when they use the technology, technology provides richer experiences, its also helpful in making classroom support assignment, use of technology improves the quality of communication. Overall, the item in the factor reveals students perception over technology usage in the classroom teaching – learning process.

TABLE – 4: FACTOR IV: LEARNING FEASIBILITY

S.NO	ITEM.NO	ITEM CONTENT	FACTOR LOADING
1	36	Technology enabled learning is more useful for career search while on study.	0.69
2	37	Classroom technologies help explaining the subject more clearly and effectively.	0.65
3	38	Technologies help me to become an independent learner by doing more work on my own.	0.60
4	39	Classroom technologies help me to further develop and stimulate my presentation skills.	0.59
5	40	The use of technology improves probing skills.	0.59
6	41	I would work harder if I could use computers more often irrespective of time.	0.58
7	42	Technology improves one's level of competency.	0.57
8	43	The use of e-learning will enable me to do any studies.	0.55

FACTOR IV: LEARNING FEASIBILITY

Table– 4 shows the factor loadings of the items under factor IV. It is noted that the first 3-items have fairly high loading ($r = 0.60 - 0.69$) and the remaining 5-items are moderately loaded ($r = 0.55 - 0.59$). The factor is defined as “Learning Feasibility” as it emphasise on the technology enabled learning is more useful for career search while on a students study, technology explains the subject more clearly and effectively and it also develops and stimulates the presentation skills in the classroom. On the whole, the factor “Learning Feasibility” contributes to 12.1% of variance.

TABLE – 5: FACTOR V: ACADEMIC ACHIEVEMENT

S.NO	ITEM.NO	ITEM CONTENT	FACTOR LOADING
1	44	Learning through technology enables to improve the performance in the class test compared to the last test.	0.71
2	45	Learning with technology has helped to improve the practical knowledge.	0.70
3	46	Technology has helped to prepare for the classroom assignment.	0.65
4	47	Technology in the classroom is highly useful for supportive learning such as seminar presentation, discussion, etc.,	0.64
5	48	Technology enabled learning enables retention skills after learning.	0.62
6	49	Technology enabled learning improves recalling skills for further learning.	0.60
7	50	Technology helps for the classroom activities.	0.58

FACTOR V: ACADEMIC ACHIEVEMENT

It is observed from the Table – 5 that the factor contains 7-items of which 2-items are fairly high loaded ($r = 0.70$ & 0.71) and rest 5-items are moderately loaded ($r = 0.58 - 0.65$). The 7-items contribute to the variance of 6.9 % the items in the factors were expressed as: Technology enables students' performance at higher level, it helps to improve practical knowledge, helps to prepare for classroom assignment and it overall improves the recalling skills while students' learning. Hence, the factor is named as “Academic Achievement”.

TABLE – 6: EIGEN VALUE AND PROPORTION OF VARIANCE OF THE 5 ATTITUDE FACTORS

FACTORS	EIGEN VALUE	PROPORTION OF VARIANCE	CUMULATIVE PROPORTION
SELF EFFICACY	15.08	30.01	30.1
CLASSROOM LEARNING	10.17	20.4	50.5
ATTITUDE TOWARDS TECHNOLOGY	7.12	18.4	68.9
LEARNING FEASIBILITY	5.06	12.1	71.0
ACADEMIC ACHIEVEMENT	3.11	6.9	78.9

From the Table – 6 it is observed that self – efficacy has the highest Eigen value of 15.08 and academic achievement has the lowest Eigen value of 3.11. Further, the observation of the Table – 6 reveals that the total 5 factors explained a cumulative proportion of 78.9 of variance, which means most of the items in the scale are relevant and valid.

CONCLUSION

The results obtained from the study reveals that the identification of various factors related to students' attitude towards technology enabled learning may help the teaching faculty in developing appropriate strategies to deliver the classroom teaching- learning in an effective manner. The identified 5 – factors such as: Self- Efficacy, Classroom Learning, Attitude towards Technology, Learning Feasibility and Academic Achievement are relevant in day- to-day learning experiences of the students.

In a study of Stephen A.Sivo and Cheng-Chang “Sam” Pan (2005), a factorial study was carried on students' characteristics and Attitudes. Further, study of Gulsen Bagci Kilic (2001), students' attitude towards computer usage was identified using standard questionnaire. A model based investigation done by Nick-Naser manochehri and Khurram Sharif (2010), identified learner attitude towards classroom technology using well designed questionnaire.

The results of the present study show that there is a strong relationship among the study variables. In this respect, the development of this scale would enlighten to identify students attitude towards technology usage in the classroom.

On the whole, the development of this scale seems to be quite promising to serve the purpose for which it is developed.

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