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Barriers and Interventions to the Use of Educational Technology in Teaching

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A B S T R A C T

The present study was conducted in two state agricultural universities i.e., one from north and one from south part of India. The universities were selected purposively based on the utilization of ET for creating better teaching approaches among teachers. Teachers of these two universities were randomly selected as a respondent from various departments.30 respondents from one university and 30 from other, thus the sample size of the study being 60. Data was collected through interview schedule and collected data were subjected to appropriate statistical analysis. The study indicated that the majority of the respondents faced barriers viz., lack of management of available budget in order to address financial barriers, heavy work load with teaching under administrative barriers, lack of training in use of hardware and software under technology barriers, lack of motivation to use of ET and Lack of interest in using ET tools under psychological barriers, lack of advance teaching aids under physical and material barriers respectively. The interventions provided by the majority of the respondents were funds may be available in time, allotment of non-academic work would be reduced, provide training on advanced educational technologies, training on knowledge and skill development regarding ET and improvement of lab facilities for teaching. Generally, this paper provides information and recommendation to those responsible for the use of new technology tools into Teaching.

Introduction

The rapid growth in Educational Technology (ET) have brought remarkable changes in the twenty-first century, as well as affected the demands of modern societies. ET is becoming increasingly important in our daily lives and in our educational system (Andoh, 2012).Over the past two decades at least, there has been rapid escalation in the use of computer and Internet technology for didactic purposes in higher education institutions across the globe (Chowdhury, 2015).The new ET have another potential benefit as tools for enhancing teaching and the advantages of ET are often under-realized (Skinner and Preece, 2003). Teachers use computer software and Internet resources to locate, process, and present information, learn and assess their skills. Usually, teachers inspire students to

use these technologies for pedagogy purpose. Hence, the ET used particularly by the teachers are very important to observe the efficiency and effectiveness of the faculties. Demographic data from the Integrated Studies of Educational Technology (ISET; U.S. Department of Education [DOE], 2003) revealed that 81% of teachers have either moderate or high levels of access to instructional computers for teaching (Ertmer, P.A. 2005).A large numbers of faculty members are still hesitant or reluctant to useET for teaching tasks (Jacobson, 1998). Research has found serious obstacles to fully integrating technology into the teaching in higher education (Becta, 2004). A number of reasons accounts for the gap between actual and expected use of ET tools. Some of the barriers to effective use of ET include teacher's attitudes and resistance to change, concern about funding, training deficiencies, inadequate access, time constraints, and lack of technical support (Pajo and Wallace, 2001).

Studying the barriers to the use of ET in teaching environment is crucial because this knowledge could provide guidance and encourage for ways to enhance the use of ET. identifying the fundamental barriers may assist teachers to overcome these barriers and become successful ET adopters (Al-Alwani,2005).The present study deals with the barriers faced by the students and suitable interventions given by them to overcome barriers regarding use of educational technology in learning. A major significance of this study is the potential to apply findings to university student's education approaches to support future learning in any virtual or physical technology enriched spaces. This paper provides descriptive analysis and content analysis of collected data that aims to present the perceived barriers to use ET in teaching and interventions to them in these studies.

The main objectives includes to study about the socio-personal, professional profile of the teachers. And to identify barriers regarding use of educational technology in teaching. Also to record and analyse the interventions given by the teachers on the barriers in teaching.

Materials and Methods

The present study was used quasi-experimental research design where data were collected through open ended interview schedule. Teachers were randomly selected as a respondent from various departments. 30 respondents from one agricultural university from South India and another30 from North India. Thus, the sample size of the study was 60.Data was collected through interview schedule. Data was collected about teacher's profile with respect to use of educational technology and collected data was analysed by the mean, standard deviation, frequency and percentage.

For the categorization of the respondents with different variables was done with mean± SD into three categories as low, medium and high. Teachers were asked to put their comments on constraints faced by them and suitable suggestions for overcoming the constraints regarding use of educational technology in teaching and collected data were subjected for content analysis and used appropriate statistical tools viz., Mean, Standard deviation Frequency and Percentage.

Results and Discussion

Profile of the teachers

This part deals with the teacher's socio-personal and professional information with respect to barriers and interventions to the use of educational technology as following:

Age of the teachers

Data were collected regarding age of the teachers, analysed and presented in the Table 1 that the majority of the teachers (60%) were belongs to middle age followed by 21.7% of the teachers were young age and only 18.3% of the teachers were belongs to old age. Age of the respondents is the very important factor which indicates the experience of the respondents with educational technologies and this is might be due to selection of respondents who had at least 2 years teaching experience for two state agricultural universities. Zhu (2010), Musbah and Karsh (2018), Hung and Yuen (2010), were recorded similar findings.

Academic level of teachers

Table 2 indicated that the academic level of teachers that the majority of the respondents (43.3% teachers) were Assistant Professor/scientist, 28.3% of the teachers were Professor/Pr. Scientist, 23.4% teachers were Associate Professor/Sr. Scientist, and another 5.0% of the teachers were Professor and Head of the Department. It may be concluded that the teachers are more experienced with their designations. Tahir *et al.,* (2008), Aparna (2014), Musbah and Karsh (2018) were recorded similar findings.

Family Background of the teachers

Table 3 indicated that the most of the respondents (65.0% teachers) were belonging to the rural family background and 35.0% of the respondents were belonging to the urban family background. It may be concluded that the teachers from urban family background are more aware of technologies which is using for teaching and having good knowledge and skill about educational technology. Pandey (2000), was find similar findings.

Knowledge on application of Educational Technology tools

The findings on the knowledge on application of educational technology tools in teaching-learning process have been depicted in Table 4.7 and Fig. 4.6. The table revealed that the majority of the teachers (76.0%) had medium level of knowledge on application of educational technology in teaching, followed by 10.0% of the teachers had low level of knowledge and only 13.3% of the teachers had high level of knowledge on application of educational technology this was might be because of sometime using educational technology for teaching purpose and they did not get effective training programme related to handling of educational technology for teaching. Sharanappa (2015) recorded similar findings.

Teachers Expertise in Technology use

Teachers expertise in technology use has been explained in Table 4.9 and Fig. 4.9. The level of expertise of the teachers in technology use was obtained that the majority of the respondents (65.0% teachers) had medium level of expertise regarding use of educational technology in teaching. This was because of teaching with advanced educational technologies and most of the teachers were familiar to teach students by educational technologies. 18.3% of the teachers had high level of expertise in use of statistical packages, search engine, multimedia, etc and only 16.7% of the teachers had low level of expertise in educational technology in teaching. The reason behind well expertise was may be probably due to attending advanced educational technology courses besides having good training facilities regarding using of educational technology in teaching. These findings indicated that the teachers were using educational technology tools and teaching aids for teaching, it might

be due to due to more use of traditional teaching method for teaching purpose. Zayim *et al.,* (2005) and Badia *et al.,* (2013) were recorded same result in their research work.

Attitude towards educational technology in teaching-learning process

The data regarding attitude towards educational technology of the teachers and students are presented in table 5. As regards attitude of the respondents towards educational technology in teaching-learning process, the majority of the teachers (68.3%) attitude had somewhat favourable followed by 13.3% of the teachers had favourable and only 18% of the respondents had unfavourable attitude towards ET in classroom teaching. These findings reveal that the teachers have moderately favourable attitude towards educational technology because of lack of training and awareness programme. Only few teachers had favourable attitude towards educational technology because they are well know that the importance of educational technology in teaching in the present educational era and the this is a part of educational life, that's why educational technology are to be made to popularize by conducting workshop and training programme in the present education system to possess favourable attitude towards educational technology. Aytekin *et al.,* (2012), and John (2015), indicated similar findings.

Job satisfaction in Teaching

Level of satisfaction of the teachers in teaching is presented in Table 6.This table indicated that the most of the respondents (66.7%) had indicated medium level of satisfaction followed by 16.7% of the respondents had indicated high level of satisfaction and 16.7% of the respondent had indicated low level of satisfaction in teaching.

These findings indicated that the teachers are generally satisfied with their job as a teaching and this is may be due to their better performance in teaching, professional growth, work task and salary. Improving teacher's sense of job satisfaction with teaching can be reduce their mental stress, and illness. Same findings recorded by Zembylas and Papanastasiou (2004), Gardharia *et al.,* (2013), Chamundeshwari (2013) in their research.

Extent of use of educational technology in Teaching

Data regarding extent of use of educational technology for its adoption in teaching-learning process was collected and the result presented in Table 7. The result indicated that the majority of the respondents (56.7% teachers) had medium use of educational technology like teaching materials, devices (hardware and software/application) and teaching method followed by some teachers (21.7%) had low (rarely) use of educational technologies and 21.7% of the teachers had highly use of educational technologies in teaching. Teachers were using materials, devices and teaching methods for effective teaching-learning outcome. These findings indicated that the teachers medium or often use educational technology for teaching purpose. It may be concluded that the use of educational technologies in teaching was medium due to lack of training regarding use of advanced educational technologies and lack of maintenance of available educational technologies and the major reason could be lack of interest in using educational technologies in teaching. Ganguli (2006), Sharanappa (2015), and Lakshmi and Babu (2018) recorded similar findings.

Barriers in using Educational technology

Multiple responses were taken to ascertain the

barriers/constraints faced by the teachers in adoption of educational technology in teaching and interventions/suggestion to overcome with this constraint. Data regarding these constraints presented in table 8. The data revealed regarding Financial barriers that the lack of management of available budget, followed by high cost for maintenance of the available ET, non-availabilityof funds in time, and availability of insufficient funds. Regarding administrative constraints that the heavy work load with teaching, followed by ineffective organizational arrangement for providing support on ET and procedural delay in purchasing educational technologies.

Table 8also revealed about technological constraints that the lack of training on use of hardware and software, followed by lack of proper maintenance of available ET tools, and lack of technical support on use of ET. Table 8 also revealed that the respondents faced many psychological constraints that the lack of motivation for use ET, followed by lack of awareness about ET tools, lack of knowledge and skill for use ET tools, and lack of interest in adopting ET tools.

Many of the respondents also indicated their physical and material constraints (Table 8) such as lack of advance teaching aids in the department, non-availability of advanced hardware and software, lack of good infrastructure facilities, and lack of good lab facilities for teaching.

Table.1

Table.1 Distribution of the Teachers according to their Age

n= 60

Sl. No.	Category	Frequency	Percentage
1.	Under 35 years	13	21.7
2.	Between 36-55years	36	60.0
3.	Above 56 years	11	18.3

Table.2 Distribution of the respondents according to their academic level

n= 60

Sl. No.	Category	Frequency	Percentage
1.	Assistant professor/ Scientist	26	43.3
2.	Associated professor/ Sr. Scientist	14	23.4
3.	Professor/ Principal Scientist	17	28.3
4.	Professor & Head	3	5.0

Table.3 Distribution of the respondents according to their family background

n=60

S.No.	Category	Frequency	Percentage
1.	Rural	21	35.0
2.	Urban	39	65.0

Table.4 Distribution of the respondents according to knowledge on application of educational technology tools

S.No.	Category	Frequency	Percentage
1.	Rural	21	35.0
2.	Urban	39	65.0

Table.4 Distribution of the respondents (Teachers) according to Expertise in ET use in Teaching

n=60

Sl. No.	Category	Frequency	Percentage
1.	Low (up to 26)	6	10.7
2.	Medium (27-35)	46	76.0
3.	High (Above 36)	8	13.3

Mean= 21.55; SD= 5.07

Table.5 Distribution of the respondents according to attitude towards ET in Teaching
n=60

Sl. No.	Categories	Frequency Percentage
1.	Unfavourable (up to 68)	1118.4
2.	Somewhat Favourable (69-86)	4168.3
3.	Favourable (Above 87)	813.3

Table.6 Distribution of the respondents according to Job Satisfaction in Teaching

Sl. No.	Categories	Frequency	Percentage
1.	Low (up to 33)	10	16.7
2.	Medium (34-44)	40	66.6
3.	High (Above 45)	10	16.7

Mean= 38.45; SD= 5.619

Table.7 Distribution of the respondents according to Mass Media Ownership

Sl. No.	Categories	Frequency	Percentage
1.	Low (up to 74)	13	21.7
2.	Medium (75-100)	34	56.7
3.	High (Above 101)	13	21.7

Teacher's data: mean= 87.18; SD= 12.94

Table.8 Barriers/constraints faced by the teachers regarding Adoption of Educational technology in Teaching

Sl.No.	Barriers/constraints	Frequency	Percentage
1.	**Financial Barriers**		
a.	Availability of insufficient funds.	34	56.66
b.	Non-availabilityof funds in time.	50	83.33
c.	Lack of management of available budget.	57	95.00
d.	High cost for maintenance of the available ET	54	90.00
2.	**Administrative Barriers**		
a.	Heavy work load with teaching	59	98.33
b.	Procedural delay in purchasing educational technologies	38	63.33
c.	Ineffective organizational arrangement for providing support on ET	43	71.66
3.	**Technological Barriers**		
a.	Lack of proper maintenance of available ET tools	53	88.33
b.	Lack of training in use of hardware and software	57	95.00
c.	Providing manpower support/technical support	39	65.00
4.	**Psychological Barriers**		
a.	Lack of interest in using ET tools.	34	56.66
b.	Lack of motivation to use of ET.	49	81.66
c.	Lack of awareness about ET tools.	48	80.00
d.	Lack of knowledge and skill to use ET tools.	47	78.33
5.	**Physical/Material Barriers**		
a.	Non-availability of advanced hardware and software	50	83.33
b.	Lack of good infrastructure Facilities	46	76.66
c.	Lack of good lab facilities for teaching	43	71.66
d.	Lack of advance teaching aids	54	90.00

*Multiple responses obtained.

Table.9 Interventions/suggestions given by the teachers to overcome constraints in adoption of educational technology in teaching

Sl.No.	Interventions/suggestions	Frequency	Percentage
1.	**Suggestions on Financial barriers**		
a.	Funds may be available in time	60	100.00
b.	Adequate funds may be provided for teaching aids	55	91.66
c.	Better management of available fund	45	75.00
2.	**Suggestions on Administrative barriers**		
a.	Allotment of non- academic work would be reduced	56	93.33
b.	Procedural delay in purchasing ET may avoided	44	73.33
c.	Effective organizational management	49	81.66
3.	**Suggestions on technological barriers**		
a.	Provide training on advanced educational technologies	60	100.00
b.	Teaching aids may be provided within time	51	85.00
c.	Better technical support on use of ET	56	93.33
d.	Technical assistant may be available in the institute	32	53.33
4.	**Suggestions on Psychological barriers**		
a.	Academic atmosphere should be developed and maintained for adoption of ET.	52	86.66
b.	Training on knowledge and skill development regarding ET	58	96.66
c.	Conduct workshop on awareness about ET for teaching purpose	48	80.00
5.	**Suggestions on Physical barriers**		
a.	Development of infrastructure facilities in the department	34	56.66
b.	Department may be well equipped with educational technology tools	55	91.66
c.	Improvement of lab facilities for teaching	57	95.00

*Multiple responses obtained.

Interventions to overcome barriers in using educational technology

In the Table 8 the respondents suggested to overcome from such constraints viz. funds should be available in time, followed by adequate funds should be provided for teaching aids, and better management of available funds. They also given some suggestion on administrative constraints to overcome these constraints that reducing allotment of non-academic work with teaching, followed by better organization management, procedural delay in purchasing ET may be avoided. Table 8 also concluded that the teachers has been given suggestions to overcome technological constraints recorded as provide training regarding advanced educational technologies, followed by better technical support on use of ET, timely providing teaching aids, and availability of technical assistant and manpower support.

Table 8 concluded that the teachers also given suggestions to overcome psychological constraints viz. provide training on knowledge and skill development regarding Educational Technology, providing academic atmosphere should be developed and maintained for adoption of ET, and conduct workshop on awareness about educational technology for teaching purpose. And suggestions given by the teachers regarding physical and material constraints that the improvement of laboratory facilities in the department, department should be well equipped with educational technology tools, and development of infrastructure facilities in the department.

The present study concluded that the most (60.0%) of the teachers were under age group between 36 to 55 years, 65.0% of the respondents were urban family background. The study indicated that the 76.0% of the

teachers had medium level of knowledge on application of educational technology tools in teaching, were having medium level expertise in technology use (65.0%), had somewhat favourable (68.3%) attitude towards educational technology in teaching, and had medium level of job satisfaction (66.7%) in teaching. Regarding Extent of adoption of educational technology on selected educational technology tools/devicesmajority of the teachers (56.7%) had medium extent of use of educational technology in teaching.

The study indicated the major barriers in adoption of Educational Technologyviz., lack of management of available budgetin order to address financial barriers, heavy work load with teachingunder administrative barriers, lack of training in use of hardware and software under technology barriers, lack of motivation to use of ET and lack of interest in using ET toolsunder psychological barriers,lack of advance teaching aidsunder physical and material barriers respectively.
The interventions/suggestions provided by the majority of the respondents were availability of funds in time,reducing non-academic work allotment,provide training on advanced educational technologies, training on knowledge and skill development regarding ETandimprovement of lab facilities for teaching.

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