CHALLENGES AND PROSPECTS OF UTILIZATION OF MULTIMEDIA RESOURCES IN THE TEACHING OF TECHNOLOGY EDUCATION IN TERTIARY INSTITUTIONS IN NIGER STATE

BY

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Abstract

This study was conducted to investigate the challenges and prospects of utilizing multimedia in the teaching of technology education in tertiary institutions of Niger State, Two research questions and 2 null hypotheses guided the study. A survey research was adopted. The population of the study comprised 49 Lecturers and 6 Instructors of technology education in the two institutions offering technology education programme in Niger State. A validated instrument which contained 15-items was used for data collection. A reliability co-efficient index of 0.84 was determined using Cronbach apha. The data was analyzed using mean rating and t-test statistic in answering the research questions and for testing the null hypotheses respectively. Finding of the study revealed that lack of knowledge on how to use multimedia for lesson delivery, non-availability of multimedia facilities, lack of knowledge on how to plan multimedia instruction, among others are the challenges of utilization of multimedia in the teaching of technology education. The findings also revealed that staff training on how to use multimedia and provision of multimedia facilities are ways of providing remedies to the challenges. In view of the findings, it is recommended among others that regular training on multimedia instruction should be organized for both Lecturers and Instructors of technology education and provision of multimedia facilities in technology education institutions for effective skill acquisition.

Keywords: Utilization, Multimedia Resources, Technology Education

Introduction

The integration of multimedia in the teaching and learning process has continued to gain more acceptance among the educators as an efficient instructional delivery alternative. Multimedia is defined by Ho (2009) as the combination of various digital media which include images, sound, text and video combined to form an integrated multi-sensory interactive application. Nasir, Alsmadi, Al-kabi and Sharadgahr (2012) also refer to multimedia as a computer mediated information that is presented concurrently in more than one medium. They further explained that multimedia consists of the following elements; text, still graphic and images, motion graphics, animation, hyper media, photographs, video, and audio. Abd-El-Aziz (2013) also stated that multimedia is a communication medium that refers to all combined use of text, images, graphs, photos, animation, sound and video to produce an integrated interactive presentation or application to communicate a massage or information to the audience. From the foregoing definitions,

multimedia resource in this context can be said to be varieties of media tools used to present information in a planned instruction to the learners.

Multimedia are used to present information in lesson delivery to encourage the learners to work in groups, express their knowledge in multiple ways, solve problems, revise their own work and construct knowledge. Kleen and Shell (1994) stressed the advantages of integrating multimedia in the classroom and explained that through participation in multimedia activities, the students can learn: the value of team work; real world skills related to technology, effective collaboration techniques, impact and importance of different media, the challenges of communicating to different audience, how to present information in compelling ways, techniques for synthesizing and analyzing complex content; importance of research, planning and organizing skills, the significance of presentation and speaking skills, how to accept and provide constructive feedback and how to express their ideas creatively. Because multimedia software and hardware furnish students with these experiences, it has the potential to create a more realistic learning context through its different media and as such can be applied to variety of educational setting. Based on this, Abd-El-Aziz (2013) opined that it will not be out of place to explore the use of multimedia as instructional medium in the field of auto mechanics which is a trade in technology education.

On a general outlook, technology education is that aspect of education deliberately designed to intervene in bringing about learning that will make people to be productive through skill acquisition. Rashtriya (2005) defined technology education as the education designed for upper secondary and lower tertiary levels to prepare middle level personnel (technicians, middle level management personnel, etc.) and at university level, to prepare engineers and technologist for higher management positions. Technology education includes general education, theoretical, scientific and technical studies and related skills. Technology education according to Usoro, Essien and Udoh (2011) is designed to enable students to acquire employability skills and thus generate decent work and income through wage – earning job or self-employment. Technology education therefore prepares learners for specific jobs or different types of work which often includes practical skills and procedural activities (Usman and Pascal, 2010), while Makoju (2003) on the other hand, stated that technology education is that type of education designed to equip the individual for entry into occupation that are within the sphere of skill craft, engineering and scientific profession. Technology education can therefore be described as that type of education meant to empower individual through provision of relevant skills.

The provision of appropriate skills through technology education represent a significant element that foster development of a country. In line with this reasoning, Tsado (2013) perceived technology education to be the greatest weapon that can be used to achieve quick desirable socio-economic transformation in Nigeria. Ibrahim and Abdulkadir (2007) asserted that technology education is instrumental in making remarkable contribution to national industrialization and economic growth of the developing countries by way of suitable manpower production according to the needs of the industry and the nation as a whole. Keshinro (2005) also stated that technology education is an action – based programme with the ultimate goal of preparing individual for meaningful employment required for national growth. Ehizogie (1998) similarly stated that technology education is the bedrock for any developmental process and an instrument of excellence in making a country self-sufficient and developed through proper use and management of human resources available within the environment. Technology education therefore has the potential of transforming the nation economically and technologically because it is designed to develop skills, abilities, understanding, attitudes, work habit and appreciation encompassing

knowledge and information needs by workers to make productive contribution to the technological growth.

Considering the critical role of technology education in socio-economic transformation of the nation, it will be pertinent to infuse multimedia which is acclaimed to be an effective instruction delivery alternative. Ho (2009) stated that multimedia plays a tremendous role in the teaching and learning process. Atsumbe, Raymond, Umar and Ajunwa (2014) also asserted that multimedia application in teaching and learning of vocational and technology education, if properly applied will help ease the bottle neck that students usually encounter in the traditional classroom which transfer complete class autonomy to the teacher. They further explained that individual need of the students usually encounter in the traditional classroom is reduced because every student is actively involved. Puteh and Shukor (2002) also stated that the integration of multimedia during practical skills acquisition make the lesson more interactive and interesting.

Despite the gains accrued by the infusion of multimedia as an effective instruction delivery alternative, the problem of effective teaching and learning in technology education still remain a recurrent issue. This is evident in the recent results of technology education student's poor academic performance in in Niger State. For instance only 2.08% of the 100 level students of School of Technical Education, College of Education Minna passed their examination in 2013 / 2014 session. (Exam Office, SOTE, COE, Minna, 2015). This ugly situation has led to a state where graduates of technology education are produced without requisite skills and are therefore unable to be self-employed or unfit to work in industries or even impart the expected skills on others. The prevalence of traditional teaching method instead of infusing multimedia, is partly responsible for the increase in the failure rate among technology education students (Tsado,2013). This brings to the fore the need to examine the challenges of utilizing multimedia in the teaching of technology education in tertiary institutions of Niger State.

Purpose of the Study

The main purpose of the study is to determine the challenges and prospects of utilizing multimedia in the teaching of technology education in tertiary institutions in Niger State. Specifically, the study sought to:

i. Determine the challenges of utilizing multi-media in the teaching of technology education.
ii. Determine ways of providing remedies to the challenges of utilizing multimedia in the teaching of technology education.

Research Questions

Two research questions guided the study:

i. What are the challenges of utilizing multimedia in the teaching of technology education?
ii. How can the challenges of utilizing multimedia in the teaching of technology education be remedied?

Hypotheses

The following null hypotheses were tested at 0.05 level of significance.

Ho_1 There is no significant difference in the mean scores on the challenges of utilizing multimedia between Lecturers and Instructors in the teaching of technology education.

Ho_2 There is no significant difference in the mean scores on how to provide remedies for the challenges of utilizing multimedia between Lecturers and Instructors in the teaching of technology education.

Methods

The study adopted survey research design because it involved eliciting information from the respondents. Osuala (2005) stated that survey research method is appropriate when survey focuses on individual belief opinion and attitude. The population of the study consisted of 49 technology education Lecturers and 6 Instructors. This comprised 25 Lecturers and 3 Instructor from the Department of Industrial Technology Education, Federal University of Technology, Minna and 24 Lecturers and 3 Instructors from School of Technology Education, Niger State College of Education, Minna. The choice of the two institutions is based on the fact that, they are the only institutions that offer technology education in Niger State. All the 49 lecturers and 6 instructors were used for the study. Therefore, no sampling was carried out. This was because of the few numbers of the Lecturers and Instructors in the two institutions. A total number of 55 respondents were administered the instrument, but only 52 questionnaires were filled and returned, with the following breakdown: 46 Lecturers and 6 Instructors. This represents 98% of the entire population in the area of study.

In collecting data, a four point scale questionnaire was used. It has three sections covering respondent bio-data, items on the challenges of utilizing multimedia in the teaching of technology education and items on how to remedy the challenges of utilizing multimedia in the teaching of technology education. The response modes were Strongly Agree (4), Agree (3), Disagree (2) and Strongly Disagree (1). The instrument was face validated by three experts in the area of technology education and educational technology from School of Technical Education Niger State College of Education, Minna and Department of Industrial Technology Education, Federal University of Technology, Minna. The reliability co-efficient index of .84 was obtained as the internal consistency for all the items – using cronbach alpha method. Data collected were analyzed using mean and standard deviation to answer research questions. A mean score of 2.50 and above on the four point scale was considered accepted, while mean score below 2.50 was considered not accepted, t-test statistic was used to test the null hypotheses at .05 level of significance.

Results

Table 1: Mean scores of technology education Lecturers and Instructors on the challenges of utilizing multimedia

S/N	Items	$\bar{X}_1$	SD_1	$\bar{X}_2$	SD_2	$\bar{X}_t$	SD_t	Decision
1.	Lack of knowledge on how to use multimedia for lesson delivery	3.50	0.66	3.17	1.17	3.34	0.92	Agree
2.	Non-availability of multimedia facilities in my institution.	3.15	0.87	3.30	0.82	3.23	0.85	Agree
3.	Available multimedia facilities / equipment in my institution are not functional.	1.72	0.81	1.50	0.55	1.61	0.68	Disagree
4.	Irregular supply of electricity to power multimedia tools.	3.45	0.75	3.17	1.33	3.31	1.04	Agree
5.	There is no Educational Technology Centre where multimedia tools can be obtained.	1.54	0.73	1.67	1.21	1.61	0.97	Disagree
6.	Attitude to work of the staff of Educational Technology Centre is discouraging.	3.07	0.93	3.17	075	3.12	0.84	Agree
7.	Poor knowledge of computer	2.74	0.95	3.60	0.55	3.17	0.75	Agree
8.	Lack of time to prepare multimedia instruction	2.96	0.87	3.0	1.19	2.98	1.03	Agree
9.	Lack of knowledge on how to prepare multimedia instrument	3.17	0.82	3.33	1.21	3.25	1.02	Agree
10.	Time allotted for lesson delivery is not enough to use multimedia.	1.63	0.80	3.50	0.55	2.57	0.68	Agree

Key: $\bar{X}_1$ = mean responses of lecturers, $\bar{X}_2$ = mean responses of instructors, SD_1 = standard deviation of lecturers, SD_2 = standard deviation of instructors, $\bar{X}_t$ = average mean of all the respondents, SD_t = standard deviation of all the respondents

Table 1 shows that 8 items had their grand mean scores ranged from 2.57-3.34, which is above the 2.50 cut off point by both the Lecturers and Instructors of technology education. The

mean score of item 10 is however rated 1.63 by the Lecturers, which means that only 7 items were agreed as challenges of utilizing multimedia by the Lecturers of technology education.

Table 2: Mean scores of technology education Lecturers and Instructors on how the challenges of utilizing multimedia can be remedied

S/N	Items	$\overline{X}_1$	SD_1	$\overline{X}_2$	SD_2	$\overline{X}_t$	SD_t	Decision
1.	Training on how to use multimedia in lesson delivery	3.01	0.91	3.33	0.82	3.17	1.73	Agreed
2.	Improved electricity supply	3.07	0.90	3.7	0.75	3.39	0.83	Agreed
3.	Purchase of different media for my institute	2.93	1.0	3.17	0.98	3.05	0.99	Agreed
4.	Orientate the attitude of the staff at the Educational Technology Center.	3.0	0.94	3.50	0.55	3.25	0.75	Agreed
5.	Adequate time should be allotted for lesion delivery to allow the use of multimedia	2.83	1.10	2.53	1.03	2.68	1.07	Agreed

Key: X_1 = mean responses of lecturers, X_2 =mean responses of instructors,
SD_1 = standard deviation of lecturers, SD_2 =standard deviation of instructors, X_t = average mean of all the respondents, SD_t = standard deviation of all the respondents

Table 2 shows that all the 5 items on how the challenges of utilizing multimedia can be remedied had their grand mean scores from 2.68-3.39 which is above 2.50 cut off point by both Lecturers and Instructors of technology education. This means that all the respondents accepted the remedies on how to
overcome the challenges of utilizing multimedia resources in the teaching of technology education.

Hypothesis One

Ho_1 There is no significant difference in the mean scores on the challenges utilizing multimedia among Lecturers and Instructors in the teaching of technology education.

Table 3: t-test analysis of response of Lecturers and Instructors on the challenges of utilizing multimedia in the teaching of technology education

S/N	**Respondents**	**N**	$\overline{X}$	**SD**	**df**	**t-cal**	**t-tab**	**prob**	**remark**
1.	Lecturers	46	3.81	0.49	50	0.68	2.02	P>0.05	ns
2.	Instructors	6	3.41	0.80					

Key: N = no of respondents, $\overline{X}$ = mean, SD = standard deviation, df = degree of freedom

t=cal =calculated value, t-tab = tabulated value, ns = no significant a P> .05 level

Table 3 revealed that, the t – calculated value is 0.68 which is lowered than the table value of 2.02. This indicated that there was no significant difference between the mean responses of the two groups of respondents on the challenges of utilizing multimedia on the teaching of technology education. Therefore, the hypothesis of no significant difference in the mean scores of the two groups of respondents was not rejected.

Hypothesis Two

Ho_2 There is no significant difference in the mean scores on how to provide remedies for the challenges of utilizing multimedia among Lecturers and Instructors in the teaching of technology education.

Table 4: t-test analysis of response of Lectures and Instructors on how to provide remedy to the challenges of utilizing multimedia.

S/N	Respondents	N	$\overline{X}$	SD	df	t-cal	t-tab	prob	remark
1.	Lecturers	46	3.70	0.3					
					50	0.42	2.02	P> .05	ns
2.	Instructors	6	3.42	0.86					

Key: N = no of respondents, $\overline{X}$ = mean, SD = standard deviation, df = degree of freedom
t=cal =calculated value, t-tab = tabulated value, ns = not significant a P> .05 level

Table 4 revealed that the t-calculated value is 0.42 which lower than the table value of 2.02. This indicated that there is no significant difference between the mean responses of the two groups of respondents on how to remedy the challenges of utilizing multimedia in the teaching of technology education therefore, the hypothesis of no significant difference in the mean scores of the two groups of the respondents was not rejected.

Discussion

The findings of this study in research question 1 indicated that out of the 10 perceived challenges of utilizing multimedia in the teaching of technology education, Lecturers agreed on 7 items as challenges that inhibit them from using multimedia in their instruction. They however disagreed with item 10 that time allotted for lesson delivery is enough to utilize multimedia, while the Instructors agreed that the item is a challenge of utilizing multimedia resources in lesson delivery. This may be due to the nature of the training they received as Instructors. However, both the lecturers and the instructors agreed that lack of knowledge on how to use multimedia for lesson delivery, non-availability of media resources, irregular electricity supply, attitude to work of the staff of Education Technology Centre, lack of knowledge on how to plan instruction using multimedia, among others are the challenges of utilizing multimedia in the teaching of technology education. This finding is in agreement with Jun (2010), Lederer (2012) and Deutscher (2009) who identified the challenges of utilizing multimedia in the classroom to include; knowledge of technical issues surrounding media, problem of professional development related to the

multimedia, problem of improving the quality of the multimedia, problem of designing curriculum based on multimedia instruction, etc. The t-test summary also showed that there were no significant differences in the mean responses between the Lecturers and Instructors on these challenges of utilizing multimedia.

For the research question 2, the respondents accepted all the 5 items as remedies for overcoming the challenges of utilizing multimedia resources in the teaching of technology education. These include: training on how to use of multimedia in lesson delivery, improved electricity supply, purchase of different media tools, re-orientate the attitude to work of the personnel of institution based Education Technology Centres and giving adequate time for lesson delivery to allow the use of multimedia. This finding is in line with that of Penuel, Means and Simkins (2000) who stated that multimedia projects can transform a classroom, but teachers need a network of support to integrate these complex technologies effectively especially in the areas of training in handling the complex technology. They also advocated for improved infrastructure in institutions of learning to allow for proper use of multimedia instruction. Puteh and Shukor (2002) also stated that in other to incorporate multimedia instruction during practical skills acquisition, the teachers need professional training on how to deliver multimedia instruction. Kleen and Shell (1994) also corroborated this finding, when they pointed out that adequate time is required to plan, design, develop and evaluate multimedia activities. The response of the respondents also showed no significant difference in their mean scores with regards to how to remedy the challenges of utilizing multimedia in lesson delivery.

Conclusion

The finding of this study showed that there are challenges of utilizing multimedia in lesson delivery, and the need to remedy these challenges for effective teaching – learning of technology education. The remedies are in the area of staff training in multimedia instruction and provision of improved infrastructure in institutions of learning. These remedies will enhance the process of practical skill acquisition which in the hallmark of technology education required for national development.

Recommendations

Based on the findings, the following recommendations are made:

- Regular staff training should be organized for both Lecturers and Instructors of technology education on how to deliver multimedia instruction.
- Technology education institution should partner with media organization with the view of providing and maintaining multimedia tools necessary for teaching and learning.
- Government at all levels should provide financial support in the provision of multimedia resources necessary for skill acquisition in technology education based institutions.
- Tertiary Education Trust Fund (Tetfund) should also give a special intervention in equipping educational technology units in schools of technology education.

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