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Multimedia technologies usage by office technology and management students in tertiary institutions

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Abstract
Globally, technology has affected the ways people perform tasks. This is the reason for this study, "multimedia technologies usage by office technology and management students in tertiary institutions." Descriptive survey research design was adopted with a population of 1,013. The sample size was 279, using Krechie and Morgan Table for determining a sample of a known population. Self-developed questionnaire of five point rating scale was used. Face and contents validity were established using the opinions of three experts with trial-test on 23 office technology and management students. Data collected were analyzed using Cronbach Alpha with coefficient values of 0.89 and 88. Out of 279 copies of questionnaire distributed, 260 were correctly filled, retrieved, and used for data analysis. Arithmetic mean and standard deviation were used to analyze data from research questions and spread in respondents' views. Inferential statistics of independent sample t-test was used to test the two null hypotheses. Findings revealed that there were high level of challenges faced by office technology and management students in the use of multimedia technologies, and that adequate funding, provision of adequate facilities, organizing training and retraining exercises for educators were strategies to overcome the challenges. Among other things, it was recommended students should engage in multimedia technologies certificate programmes with funding via part time jobs. Parents should also ensure that learners have good ICT background before admission and during schooling periods to enable them acquire the needed multimedia technological skills for jobs creation.

Keyword: Utilization, multimedia technologies, utilization of multimedia by learners, office technology and management students, tertiary institutions

Introduction

All over the world, technological advancement has continued to change the way people perform tasks and solve their daily problems. This has affected the operational processes in various sectors of the economy. According to Vockley (2012) [26], no industry or organization can remain competitive today without making comprehensive use of technology in all of its operations. In the education sector, digital technologies play vital roles especially in transforming the methods of learning as well as the overall educational research activities. Today's students are immersed in a variety of technologies from young age. They grew in a society engrossed with technology as "digital natives", and also a generation that has spoken the language of technology from birth with varieties of multimedia technologies in form of computers, Internet, Instant messaging, social networking sites, and cell phones that provide instant communication locally and globally.

Multimedia is a combination of more than one media type such as text (alphabetic or numeric), symbols, images, pictures, audio, video, and animations usually with the aid of technology for the purpose of enhancing understanding or memorization (Ukata and Udeh, 2022 [24]; Guan, Song & Li, 2018) [9]. Multimedia technology has some characteristics like integration, diversity, and interaction that enable people to communicate information or ideas with digital and print elements. Multimedia technology is an aspect of Information and Communication Technology (ICT). ICT involves the use of hardware and software for the purpose of collecting, processing, storing, presenting, and sharing of information mostly in digital forms. Multimedia technology is an important aspect of ICT that deals with how information can be represented and presented digitally, using different media such as text, audio, video, among others (Guan *et al*., 2018) [9]. It involves the combination of several technologies that provide information in the best possible formats, packages, and sizes.

Multimedia technologies or digital learning resources assist learners to get on well with mental representations with the use of different media elements, which support information processing. Information, which is made up of contents and sometimes learning activities, are presented with the use of the combination of text, image, video and audio by digital learning resources. Some of the benefits of the multimedia application tools for learning are summarized as follows: Ability to turn abstract concepts into concrete contents, ability to presents large volumes of information within a limited time with less effort, ability to stimulate students' interest in learning, provides teacher with the ability to know students position in learning. Multimedia could be found in the form of text, audio, video, image, animation, annotation and 3-D. Common to all is the fact that multimedia involves the combination of various digital types such as text, sound, video to disseminate information for better understanding of audience. According to Oghomwen (2016) [17], multimedia is a combination of various digital media types such as text, image and video integrated multimedia sensory interactive applications to convey a message or information to an audience.

Multimedia technology is a creative combination of computer hardware and software that allows for integration of video, animation, audio, graphics and text resources in such a way that information can be accessed interactively with any information processing devices (Ugochukwu, Kabiru, Okafor, Chukwuma, & Amoo, 2019) [20]. Ilechukwu (2013) [11] observed that the utilization of e-learning has made it possible to acquire educational services devoid of traditional classroom challenges. Egbiri (2012) [5] stated that lecturers, instructors and students cannot do much without adequate knowledge of ICT including multimedia systems.

Utilization of multimedia is a system of using multimedia as part of digital technology in the field of education for effective learning. Utilization of multimedia could be described as a wide range of computer-based learning resources/applications or that complement the educational process (Nwangwu, 2018**)** [13]. Such technologies include computer systems, mobile devices (such as iPad, iPhone), multimedia projectors, interactive whiteboards, internet facilities, courseware and software design tools (such as authoring tools) among others. These technologies can be combined to produce multiple media elements, often referred to as multimedia. Utilization of multimedia is the field that concerned with the computer-controlled integration of text, graphics, drawings, still and moving images (video), animation, audio, and any other media where every type of information can be represented, stored, transmitted, and processed digitally by learners. Similarly, Oshinaike and Adekunmisi (2012) [19] defined utilization of multimedia as the combination of various digital media types such as text, images, sound and video into an integral multi-sensory interactive application or presentation by the teacher to convey a message or information to an audience or learners.

There are two main categories of multimedia technologies used for learning, they are the hardware and software. The multimedia hardware components include the part of the computer system one can see and touch, multimedia/data projector, interactive whiteboard, instructional CDs/DVDs, iPad/smart phones, internet facilities, digital camera, microphone, speaker, etc., while multimedia software include enhances the effectiveness of video, audio, graphics, animation, e-learning platforms as well as software used for editing multimedia elements. Multimedia technologies usage in this study is the ability of Office Technology and management (OTM) students in tertiary institutions to learn courses contents and acquire employability skills through the use of multimedia.

Multimedia technologies usage in this context also mean the ability of students to use multimedia technologies such as computer system, multimedia/data projector, interactive whiteboard, instructional CDs/DVDs, iPad/smart phones, internet facilities, digital camera, microphone, speaker, video, audio, graphics, animation, e-learning platforms to learn course contents and acquire employability skills. Multimedia technologies usage as well means an effective interactions among the students, the teachers, the course contents, and the knowledge/skills/dispositions of the students will need for learning in collaborating with others in a diverse society and rapidly changing world through the application of multimedia in form of text, audio, video, image, animation, annotation and 3-D which are part of OTM courses.

Office Technology and management programme is an aspect of business education that prepares individuals for roles in modern offices as office managers either as an employee or employer. OTM programme is an efficient, effective, productive and functional educational programme that leads to self-employment, self-reliance and consequently self-actualization. Eluwa (2021) [8] averred that, multimedia as part of new technologies and electronic resources aid the effectiveness learning, especially in Office Technology and Management programme. Eluwa (2021) [8] further argued that, new technologies have great potential for effective learning. The courses contents of OTM programme cannot be effectively acquired in tertiary institutions without good knowledge and skills of multimedia as an aspect of information and communication technologies.

OTM courses are course offered at the National Diploma I and II, and Higher National Diploma I and II. The courses are also offered in years 1, 2, 3 and 4 of universities and colleges of education (Ukata, Nmehielle & Silas-Dikibo, 2017) [22, 23]. Some of the courses are Use of English , Citizenship Education, and Introduction to Business, Shorthand, Information and Communication Technology I, Office Practice I, Keyboarding, French I and Business Mathematics. Others are Communication in English, Information and Communication Technology II, Citizenship Education II, Introduction to Entrepreneurship, Principles of Law, Career Development, Shorthand II, Modern Office Technology and Keyboarding II. The following are also some of the courses, Use of English II, Research technique, Shorthand III, Office Practice, Desktop Publishing, Principles of Accounting and Keyboarding. Learners also have the opportunities of offering Communication in English, Records Management , Principles of Economics I, Web page Design, Principles of Communication Skills , SIWES and Project. There are also courses like ICT Office Application I, Social Psychology, Professional Career Development, ICT Office Application II, Nigeria Labour Law, Human Capital Development, Database Management System, Oral Communication Skills, Element of Human Resource Management, Advanced Desktop Publishing, Management Information System, Professional Ethics and Social Responsibility, Entrepreneurship and Advanced Webpage Design, among others, (Ukata, 2019; Agbongiasede, 2014) [2].

Fadare (2014) [7] revealed that business teachers (OTM lecturers inclusive) in tertiary institutions are not adequately utilizing ICT for instructional delivery due to lack of new technology skills which has seriously affected the learners. Nwaukwa (2015) [14] also founded out that business teachers utilize computer and software facilities but in a small and low extent due low level of skills, inadequate and non-functional facilities. Nwaukwa lamented that majority of business teachers lack computer skills required to integrate new technologies, which include multimedia for successful instructional delivery to enable learners acquire the skills and use the multimedia technologies in return. In this study, OTM students in tertiary institutions are only those in federal and state governments' colleges of education, polytechnics and universities learning OTM courses either as a course or as an option in Business Education.

This study, "multimedia technologies usage by office technology and management students in tertiary institutions" is awfully important because it will reveal types of multimedia technologies, challenges associated with the usage as well as proffer implementable solutions in form of recommendation(s). The moderating factors for this study are students personal and governments' factors. The students' personal factors are those factors that emanated from the students which may affect and influence their multimedia technologies usage. They are factors that may or may not be under their control but are related to them and their family background. Factors such as commitment, personal training, and provision of laptop, data, and good ICT background before admission may influence and affect students` multimedia technologies usage. Also, personal factors such as age, gender, education, funding and experiences may influence multimedia technologies usage (Amofah & Saladrigues, 2022 [3]; Trivedi, 2017) [21].

The governments factors are those factors that are caused either by the state or federal governments. They also include factors from the managements of the state and federal universities, polytechnics and colleges of education. The governments' factors include provision of good policies and implementation, regular learning of practical, adequate funding, good quality teachers, provision of multimedia technologies facilities such as laboratories, classrooms, equipment, hardware and software. Factors such as good working conditions, better job security, training and retraining with certifications programmes are also influential. The institutions management factors include providing enabling teaching and learning environment, sponsorships in conference, certifications, workshops, and training the trainer programmes among others. The role of tertiary institutions (universities, polytechnics, and collages of education) as provider and enabling conducive environment for multimedia technologies usage cannot be overstressed (Amofah & Saladrigues, 2022 [3]; Trivedi, 2016).

Also, for emerging economies, the digital economy that is based on digital skills and competencies presents similar challenges where governments play varying activist roles, not only in innovation and adaptation of new waves of digital technologies but also in the assimilation and diffusion of these technologies across the whole economy in partnership with business, to promote a dynamic ICT ecosystem, create a highly networked system of actors, and invest in the platforms and human capital required for the digital economy for entrepreneur with digital skills to acquire decent works (Hanna, 2018) [10]. There is historical evidence that these governments have broaden and deepened their entrepreneurial and innovation roles, harnessing successive strategies and patient investments to build a dynamic digital transformation ecosystem, ubiquitous internet access, digital platforms, digital literacy, digital leadership, and sustained commitment to transform (Mazzucato, 2013) [15].

Statement of the Problem

The reasons for the reviewed and incorporation of new technologies into Office Technology and Management programme courses are for adequately utilization of multimedia technologies by teachers and learners to enable learners acquire the needed skills for global employment. Unfortunately most lecturers seem to have not been able to utilize new technologies in teaching students which may have contributed to high rate of unemployability skills and unemployment.

The problem of this study is that, the emerging report from employers of labour seem to show that most students have not been able to utilized multimedia technologies as expected perhaps because of unavailability and inadequacy of new technologies in most of our tertiary institutions. Therefore the rationales for this study" multimedia technologies usage by office technology and management students in tertiary institutions"

Purpose of this Study

The major purpose of this study was to determine multimedia technologies usage by office technology and management students in tertiary institutions. Specifically, the study finds out the level of:

1. Challenges faced in the use of multimedia technologies by office technology and management students in tertiary institutions.
2. Strategies to overcome the challenges faced in the use of multimedia technologies by office technology and management students in tertiary institutions.

Research Questions

The following research questions guided the researchers, from the perception of office technology and management students:

1. What is the level challenges faced in the use of multimedia technologies by office technology and management students in tertiary institutions?
2. What are the strategies to overcome the challenges faced in the use of multimedia technologies by office technology and management students in tertiary institutions?

Hypotheses

The following two (2) null hypotheses were raised and tested at 0.05 level of significance:

1. State and federal institutions` students do not differ in the mean rating on the level of challenges faced in the use of multimedia technologies in tertiary institutions based on their personal training and provision of laptops.
2. There is no significant difference in the mean ratings of state and federal institutions` students on the strategies to overcome challenges faced in the use of multimedia technologies based on the provision of multimedia equipment and regular learning of practical.

Methodology

Descriptive survey research design was adopted for the topic, "multimedia technologies usage by office technology and management students in tertiary institutions in rivers state." Descriptive survey research design was deemed appropriate since it sought to obtain the views students on the topic under investigation. The population of this study was numbered 1,013 which consisted of year 4 students of Rivers State University, Ignatius Ajuru University of Education, Federal College Technical Omoku and Ken Saro-wiwa polytechnic, Bori (Higher National Diploma (HND 2).

Rivers State University had a total of 368 and Ignatius Ajuru University of Education was 346, Federal College Technical Omoku (FCTOMOKU) was 149 and Ken Saro-wiwa Polytechnic (KENPOLY), Bori had 150 (Departments of Business Education (FCTOMOKU, 2022); OTM Dept. KENPOLY, 2019; & Ukata, 2019) [25]. Below is the displayed population of the study using exploded pie in 3 D, including their percentages:

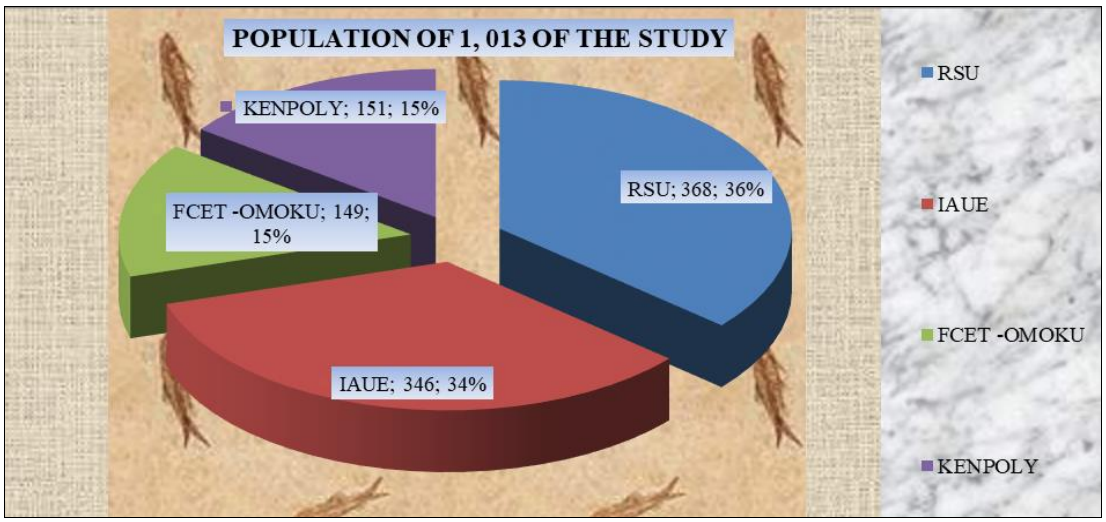

Fig 1: Population of 1,013 for the study; Source (Researchers` design, 2023)

The targeted population was chosen from the four tertiary institutions in Rivers State offering office technology and management either as a course or an option in Business Education. Years 1, 2, 3; Higher National Diploma Year 1, and National Diploma Years 1 and 2 students of the four tertiary institutions were not included in the population of this study because they may not be able to provide a fair judgment on multimedia technologies usage. Captain Elechi Amadi Polytechnic runs Office Technology and Management but was not included because it does not have Higher National Diploma Programme. The sample size was 278, using Krechie and Morgan Table of 1979 for determining a sample of a known population of 1013. The instrument for data collection was a self-developed questionnaire based on the reviewed related literature and research question posed. The instrument was titled: "Multimedia Technologies Usage by Office Technology and Management students (MTS-OTMS)", with five point rating scale of the following options: Very High Level (5), 4.50 - 5.00, High Level (4), 3.50-4.49, Moderate Level (3), 2.50-3.49, Low Level (2) 1.50-2.49 and Very Low Level (1) 0.50-1.49. The face and contents validity of the instrument were established using the opinions of three experts from the departments of Business Education of Rivers State University and Ignatius Ajuru University of Education. The questionnaire was trial-tested using 25 Office Technology and Management Student, Abia State Polytechnic. Data collected were analyzed using Cronbach Alpha which yielded coefficient value of .89 and .88. The high reliability values indicated that the instrument was reliable for the study. The researchers personally administered copies of the questionnaire to the respondents in their schools with the help of four research assistants. The research assistants were adequately briefed on the modalities for administration and collection of the questionnaires. On the spot completion and time gap of one week were used for those who could not fill the questionnaire immediately.

Out of 278 copies of questionnaire distributed, 260 were correctly filled, retrieved, and used for data analysis. The arithmetic mean and standard deviation were used to analyze data from research questions and determine the homogeneity and heterogeneity of respondents' views, while the inferential statistics of independent sample t-test was used to test was used to test the two null hypotheses. The justification for adopting independent sample t-test was because the null hypotheses contained one independent variable and two levels. A null hypothesis was rejected where the calculated significant (Sig.) value, (p- value) was greater than or equal to (≥) the alpha value of 0.05. Otherwise, the null hypothesis was not rejected. The data analysis was carried out using Statistical Package for Social Sciences (SPSS) version 25.

Result Presentation, Analysis and Discussion

Research Question 1

What is the level challenges faced in the use of multimedia technologies by office technology and management students in tertiary institutions?

Table 1: Respondents` mean ratings on the level of challenges faced in the use of multimedia technologies by Office Technology and Management students

				N=260
SN	**Items on the challenges of utilization of Multimedia**	**X**	**SD**	**Remarks**
1	Low availability of multimedia facilities in my Department	3.50	.84	High Level
2	Some of the ICT facilities in the departmental laboratory are not functional	3.55	.84	High Level
3	Poverty is a major setback in the usage of multimedia technologies	3.51	.82	High Level
4	Most OTM students had poor ICT background	3.52	.88	High Level
5	Most OTM lecturers lack multimedia presentation skills	3.41	.85	Moderate Level
6	There is shortage of electricity supply in the campus	3.16	.81	Moderate Level

7	There is no internet facility on campus students usage	3.80	.80	High Level
8	Lack of technical personnel for the maintenance of the available multimedia facilities	3.85	.84	High Level
9	Departments receive little or no funds to purchase and maintain multimedia equipment	3.30	.84	Moderate Level
10	Multimedia design apps are costly to purchase	3.65	.81	High Level
11	Limited space/lab for practical skills training	3.50	.79	High Level
12	multimedia technologies are expensive to purchase	3.55	.84	High Level
13	Heavy workload on staff affects the use of multimedia in the classroom	3.52	.79	High Level
14	Most OTM lecturers feel reluctant in adopting multimedia because they are afraid of exposing their poor ICT skills before their students	3.89	.89	High Level
15	It is time-consuming to teach with multimedia	3.28	.89	Low Level
16	Enough time not allocated to ICT courses	3.52	.79	High Level
17	No support funds to go on training/retraining	3.80	.79	High Level
	Aggregate Mean	3.55		High Level

Source: Researchers` Field Work (2023)

Data in Table 1 shows 13 items out of 17 with mean scores ranged within 3.50-3.89. This means high level of challenges. Three (3) out of the 17 items had mean scores that ranged within 3.16-3.41, indicating moderate level. The aggregate mean was 3.55, representing high level. This mean that high level of challenges were faced in the use of multimedia technologies by office technology and management students in the tertiary institutions. The standard deviation ranged within 0.79-0.89, this means that Respondents were homogeneous in their views that high level of challenges were faced in the use of multimedia technologies by the students.

Research Question 2

What are the strategies to overcome the challenges faced in the use of multimedia technologies by Office Technology and Management students in tertiary institutions?

Table 2: Respondents` mean ratings on the strategies to overcome challenges faced in the use of multimedia technologies by office technology and management students

				N=260
SN	**Items on strategies to overcome challenges in the use of utilization of Multimedia**	**X**	**SD**	**Remarks**
18	Regular training/retraining of OTM lecturers on innovative ways of teaching with multimedia	3.53	.74	High Level
19	Adequate provision of electricity by management/government	3.50	.73	High Level
20	Adequate funds for the purchase and up-to-date multimedia facilities by governments	3.56	.76	High Level
21	Purchase of equipment by schools management through internally generated revenue	3.76	.71	High Level
22	Deployment of ICT/Technical staff for regular maintenance of multimedia equipment	3.52	.75	High Level
23	Provision of quality and uninterrupted internet services for use by the lecturers	3.76	.71	High Level
24	Collaboration among staff within and outside the school for sharing of multimedia materials and ideas	3.50	.74	High Level
25	Organizing regular mentoring sessions for both old and new staff on ICT utilization in the classroom	3.74	.74	High Level
26	Collaborative teaching among OTM lecturers for knowledge tapping and sharing	3.76	.71	High Level
27	Professional advice and supports from OTM course related professional bodies	3.74	.74	High Level
28	Industries support in purchasing multimedia facilities	3.53	.74	High Level
29	Embarking on personal training and retraining by lecturers	3.76	.71	High Level
30	Allocation of enough time for multimedia practical sessions	3.50	.74	High Level
31	Effective monitoring and facilities replacement	3.74	.74	High Level
	Aggregate Mean	3.60		High Level

Source: Researchers` Field Work (2023)

Data in Table 2 shows that items numbered 18 - 31 had mean scores ranged within 3.50 - 3.76, meaning high level. The aggregate mean was 3.60, representing high level. This means that those were high level of strategies to overcome the challenges faced in the use of multimedia technologies by office technology and management students in the tertiary institutions. The standard deviation for that 14 items ranged within 0.71 - 0.76. This shows that respondents were homogenous that those are the strategies to overcome the challenges faced in the use of multimedia technologies by Office Technology and Management students.

Analysis of Hypotheses

Hypothesis 1

Table 3: Summary of t-test on level of challenges faced in the use of multimedia technologies by office technology and management students

Sources of Variation	N	$\overline{X}$	SD	Df	t-value	p-value(Sig. (2-tailed)	Decision
State	221	5.87	.91	282	.92	.93 Significant	$H_{O\,1}$ Reject
Federal	39	3.70	1.10				

Source: Researchers` Field Work (2023)

Data on Table 3 shows a calculated t-value of 0.92 with a significant (sig.) p-value of 0.93 is greater than the alpha value of 0.05 (0.92 > 0.05) at degrees of 282. Therefore, the null hypothesis (H_{O1}) was rejected. This means that state and federal institutions` students differed significantly in the mean rating on the level of challenges faced in the use of multimedia technologies in tertiary institutions based on their personal training and provision of laptops.

Hypothesis 2

There is no significant difference in the mean ratings of state and federal institutions` students on the strategies to overcome challenges faced in the use of multimedia technologies based on the provision of multimedia equipment and regular learning of practical.

Table 4: Summary of t-test on strategies to overcome challenges faced in the use of multimedia technologies by office technology and management students.

Sources of Variation	N	$\overline{X}$	SD	Df	t-value	p-value(Sig. (2-tailed)	Decision
State	221	6.87	.91	282	.95	.91 Significant	H_{O2} reject
Federal	39	4.70	1.00				

Source: Researchers` Field Work (2023)

Data on Table 4 shows a calculated t-value of 0.95 with a significant (sig.) p-value of 0.91 is greater than the alpha value of 0.05 (0.95 > 0.05) at degrees of 282. Therefore, the null hypothesis (H_{O2}) was rejected. This shows that there is significant difference in the mean ratings of state and federal institutions` students on the strategies to overcome challenges faced in the use of multimedia technologies based on the provision of multimedia equipment and regular learning of practical.

Discussion of Findings

Challenges faced in the use of multimedia technologies by the students

Findings shows that high level of challenges were faced in the use of multimedia technologies by office technology and management students in tertiary institutions. The findings concur with Ukata and Kalagbor (2017) who discovered that low utilization, inadequate/non-functional laboratory facilities, shortage of instructional resources, poor time management issues, poor funding, low and lack of skills, are factors that are responsible for poor performance of students in programme courses in Nigerian higher institutions.

Also, Bent and Katja (2013) [4] stated that using multimedia can be time consuming and that the production of multimedia takes much time. This imply that learners will not adequately acquire the needed multimedia technologies skills, as such, the high rate of unemployment may continue. Findings of the study from the null hypothesis one further shows that federal and state tertiary institutions Office Technology and Management students differed majorly on the level of challenges faced in the use of multimedia technologies in tertiary institutions in Rivers State.

Strategies to overcome the challenges faced in the use of multimedia technologies by students

Findings shows that those are the strategies to overcome the challenges faced in the use of multimedia technologies by the students in tertiary institutions were on high level. The findings are in agreement with Eneovo (2018) [6] who noted adequate funding, provision of adequate facilities, organizing training and retraining exercises for educators, and provision of alternative source of power are among the strategies required to ameliorate the challenges to utilization of ICT for teaching and learning. The findings also corroborates with the study of Okoli and Okorie (2015) [18] who founded availability, maintenance and adequacy of teaching facilities as sine qua non for the attainment of educational goals of tertiary institutions. This imply that if these strategies are strictly followed the high level of challenges in the use of multimedia technologies will be overcome. It also imply that students will adequately acquire the needed multimedia technologies skills to gain employment and reduce high rate of unemployment.

Findings of the study from null hypothesis one shows that state and federal institutions` students differed significantly in the mean rating on the level of challenges faced in the use of multimedia technologies in tertiary institutions based on their personal training and provision of laptops. The reason for the difference may be as a result of the students` personal training had with their laptops. Findings of the study from null hypothesis two shows that there was significant difference in the mean ratings of state and federal institutions` students on the strategies to overcome challenges faced in the use of multimedia technologies based on the provision of multimedia equipment and regular learning of practical. The reason for the significant difference may as result the different institutions approach in the provision of multimedia equipment and regular learning of practical during teaching and learning.

Summary of Findings

From the result presented and discussed, the findings are summarized as follows, that:

1. There were high level of challenges were faced in the use of multimedia technologies by the students in tertiary institutions.
2. This identified items were high level of strategies to overcome the challenges faced in the use of multimedia technologies by the students in the tertiary institutions.
3. State and federal institutions` students differed significantly in the mean rating on the level of challenges faced in the use of multimedia technologies in tertiary institutions based on their personal training and provision of laptops.
4. There was significant difference in the mean ratings of state and federal institutions` students on the strategies to overcome challenges faced in the use of multimedia technologies based on the provision of multimedia equipment and regular learning of practical.

Conclusion

Based on the findings, it was concluded that, there were high level of challenges faced in the use of multimedia technologies. Adequate funding, provision of adequate facilities, organizing training and retraining exercises for educators, and provision of alternative source of power are

some of the strategies to overcome the challenges. State and federal institutions` students differed on the level of challenges faced in the use of multimedia technologies in tertiary institutions based on their personal training and provision of laptops, state and federal institutions` students also differed on the strategies to overcome challenges faced in the use of multimedia technologies based on the provision of multimedia equipment and regular learning of practical.

Recommendations

Based on the findings of this study, the following recommendations were made:

1. Students should engage in multimedia technologies certificate programmes via part time jobs. Parents should also ensure that learners have good ICT background before admission and during school by enrolling them in multimedia technologies certificate programmes.
2. Heads of Departments, Managers and administrators of tertiary institutions in Rivers state should utilize part of the internally generated revenues (IGR) to procure multimedia technologies within their ability, training and retrain lecturers without depending entirely on funds from governments.
3. Federal and state governments should seriously support tertiary institutions to procure new technologies for OTM departments since their acquisition is capital intensive to be borne by departments and institutions which affect their utilization by lecturers.
4. Federal and state government should periodically organize conferences, seminars and workshops on the use of new technologies for the benefit of the lecturers and learners.

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