ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/25may2113

Constraints Associated with the use of New Technological Media in Technology and Vocational Education

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Publication Date: 2025/06/07

Abstract: This paper focused on the constraints associated with the use of new technological media in technology and vocational education. Concepts such as new technological media, technology and vocational education and those constraints associated with the use of new technological media were discussed. The major constraints identified are poor funding of technology and vocational education, poor supply of electricity, unavailability of new technological equipment and facilities, instructors' lack of knowledge on new technological media, obsolesce of Technology Education curriculum, lack of maintenance in Technology Education workshops and lack of Skills and training by the teachers and workshop instructors of technology and vocational education. Therefore, the paper suggested that the challenges with the use of new technological media confronting the practice of technology and vocational education in Nigeria in this era of new media technologies are alarming and should not be ignored. Thus, the solutions were that technology and vocational education should be properly funded, since money is required to purchase some new technological media. There should be an adequate electric power supply in the workshop for effective practical utilization of new technological media. The curriculum of technology and vocational education should be updated to inculcate the use of new technological media and to meet up with the global requirement for employment, and a conclusion was drawn.

Keywords: *New Technological Media, Technology and Vocational Education in Nigeria, Constraints and Solutions.*

How to Cite: Agu, Paul Maduabuchi; Nweze, Isaiah Ifeanyi; Anyim, Tochukwu; Nwofor, Amuche Prince; Idenyi, Emmanuel Ebenyi; Edeh, Kelvin Ikechukwu (2025). Constraints Associated with the use of New Technological Media in Technology and Vocational Education. *International Journal of Innovative Science and Research Technology,* 10(5), 3953-3958. https://doi.org/10.38124/ijisrt/25may2113

I. INTRODUCTION

Advancement in technological media has ushered in solutions to problems of learning across different course of study, technology and vocational education inclusive. Kozma (2019) has emphasized the possibilities and effectiveness of technological media in changing the way teachers teach and the way students learn. Research on new technology is gaining global attention, as it provides a quite number of ideas on the various techniques that may be valuable for effective teaching and learning activities (Fisher and Khine, 2016). Thus, new technological media could offer new methods for teaching and learning activities. Pierce et al, (2017) ascertained that, adopting this new technological media method may enhance learning through cognitive, psychomotor and affective mediums. However, Shavinina (2001:70) claimed that the primary purpose of new technological media includes the development of human mental resources that make people to successfully apply acquired or existing knowledge and be able to produce new insights.

Therefore, the use of new technologies such as laptops and computers, projectors, multicolour images, audio-visual display, watch cameras, electronic board, close circuit television (CCTV), projected slides, oscilloscope and digital multi-meter among others could give students opportunity to develop capacities for high and quality learning and increase their ability for innovations (Aduwa et al, 2005).

New technological media can be defined as any hardware, software or tool that is used to compose, create,

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/25may2113

produce, deliver and manage media including audio, video, images, interactive media, virtual reality and augmented reality environments. New technological media is any type of technology that transfers information through digital techniques, computerized system or data networks. According to Shavinina (2001:70) new media technology is seen as any type of application that are specifically designed to transfer information, idea through computerized systems, data networks or via digital techniques. The most common instances of new media technologies are digital media or internet-based ideas, like electronic learning boards, projectors, watch cameras, and DVDs. The author defined new technological media as any invention, discovery, advancement, or innovation that was not previously possible. This includes, but not limited to, new machines, processes, or software, as well as upgrades or new uses for existing machinery, processes, and emerging technologies. He further stated that, new technological media are devices, apparatus, or processes that are different from those that were previously employed and have undergone significant change as a result of the introduction of new technology.

Shavinina (2001:70) in his opinion stated that, the typical or traditional classroom is now a technology-supported and aided learning environment due to the introduction of new technologies. According to Dede (2018), students' motivation, comprehension, and retention would all arise in a technology-assisted learning environment. Students can actively participate in new technology media, which enhances their knowledge and skills and helps them connect their academic experiences to professional endeavors (Yusuf, 2005). By offering authentic examples of content for competency and performance improvement, new technological innovations in the classroom enhance instruction and offer solid backing for theoretical notions (Oliver, 2010). As it connects theory to practice and knowledge to skills, the integration of new electronic media into the teaching-learning process appears to close the gap between professional activity and education. It makes use of information communication technology gadgets which provide a meaningful and real learning environment which are related to the workplace the students are likely going to meet in the future. Examples of new technological media are laptops and computer system, LCD Projectors, multicolour images, audio-visual display, watch cameras, electronic board, close circuit television (CCTV), projected slides, oscilloscope and digital multi-meter. These new technological media are used for effective teaching and learning in the workshops and classroom as well.

It is obvious to state that, even though this new technological medium could help to clarify students' misconceptions about concepts and to identify effective solutions to learning problems, Bostock (2018) regrettably opined that technology and vocational education over the years has not fully implemented the effective use of this new technological media for teaching and learning which helps to improves student's retention of facts. The curriculum of technology and vocational education has become so obsolete that it no longer includes the effective use of new technological media for learning. Therefore, in technology and vocational education, there are factors which hinder the use of these new technological media. According to Bostock (2018), a number of factors contribute to this regrettable development, including funding for the department of technology education, a lack of new technological media, a lack of knowledge about how to use it, a lack of maintenance for technological devices, a poor power supply, and more. He added that if new technical media are used for efficient teaching-learning processes in the classroom, technology and vocational education will reach their full potential.

Technology and vocational education is a form of education that "prepared mankind in terms of acquisition of skills ahead of a chosen profession" (Sanusi, 2001). The Technology and vocational education origin is as old as man's effort to live, learn, and work so as to satisfy his increasing wants and needs. The discipline can impact positively on the economic development, promoting social inclusion in the society and achieving full employment opportunity. It is that aspect of education designed mainly to prepare students through manipulation of tools and equipment for direct entry into occupations (Virgi and Olusanya, 2009). The result of successfully completing of such a program offers a degree that is applicable to the job market and accepted by the appropriate authorities such as the association of employers and the ministry of education in the nation where it is earned.

Technology education, in the words of Okorie (2001), is an organized program of courses with learning experiences that starts with advancement in technology, supports fundamental academic and life skills, enables higher academic standards to be met, prepares students for industry-defined work, and advances educational continuity. According to the National Policy on Education FRN (2013), the objectives of technology and vocational are to produce skilled labour in the applied science, technology, and business, especially at the craft, advanced craft, and technological levels; to impart the technological knowledge and skills required for commercial, agricultural, and economic development; and to enable economic self-sufficiency. Vocational and Technology education both use technological media to teach and learn.

Examples of new technological media that can be used in technology and vocational education for effective teaching and retention of ideas by the students and their uses are Laptops/Computer system (this is used for sending and receiving information, research, virtual coaching and tutoring), close circuit television (CCTV) (is used for detecting criminal acts, teleconferencing, remote monitoring of workshops and facilities), electronic watch cameras (this is used to create safe environment for teachers and students by monitoring, improve emergency preparedness and response), LCD Projectors (the projector enable teachers to create bulleted PowerPoint presentation for the class), audio-visual display system (this is used for displaying information within the school premises which serves as direction to the different parts of the school), television broadcast (a television broadcast is used for disseminating information to the notice of both the students and teachers), palmtops/telephone gadgets (a telephone gadget allows connection to electronic

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grade book program, to obtain test schedules via voice mail and for checking attendance records), teleconferencing network (this is used for online lecturing between teachers and students, scheduling meetings and for virtual distance learning) and electronic whiteboard (this is used for different learning styles and as a tool for note-taking). Bostock (2018) stated that these new technological media helps to improve the quality of teaching and learning and also improves retention.

As it seems, most developing countries like Nigeria, regrettably, are still lagging in the full use of new technological media in all aspects of educational practice. Bostock (2018) in his opinion stated that for effective teaching to be achieved, it is imperative that these new-technological media are used in technology and vocational education which will make them to be at her peak.

II. CONSTRAINTS ASSOCIATED WITH THE USE OF NEW TECHNOLOGICAL MEDIA IN TECHNOLOGY AND VOCATIONAL EDUCATION

➢ *A Quite Number of Constraints have been Militating Against the use of New Technological Media in Technology and Vocational Education in Nigeria. Okafor (2012) Stated that these Constraints are not Limited to the Following:*

- *Poor Funding of Technology and Vocational Education:*

Funding is necessary for any effective technology and vocational education. Ikpe (2006) stated that technology and vocational education as a programm should be seen as investment. Unfortunately, government and most organization tend to ignore the proper funding of technology and vocational education department especially for the acquisition of new technological media. New technological media truly are expensive to procure. Ikpe (2006) however asked "will the government and some Nigeria organization be able to bear the cost of acquisition and maintenance of new technological media especially ICT gadgets"? Indeed, inadequate funding also contributed immensely to poor technology and vocational education practice in this era of new media technologies. Apart from acquiring and maintaining of new media, technology and vocational education department need finance for both planning and implementing the use of new technological media which are not readily available in most developing countries like Nigeria.

- *Unavailability of New Technological Media:*

Technology and vocational education workshops generally lack newer technological equipment and machine for practical works and this has posed a very big challenge in assessment of technology and vocational education. Technology and vocational education despite its long existence do not have new technological media for use. Most of its training are done without new technological media and this will lead to the production of half baked graduates. Some common new technological media like LCD Projectors, Electronic Whiteboards, and Computers are not available for use. The government and others are unwilling to purchase modern technological media facilities and equipment required for students' use in classroom and workshops and this end up denying users the ability to practically use these new technological media facilities in the workshop.

- *Poor Knowledge of Technologists on the use of New Technological Media:*

Poor knowledge of technology and vocational education instructors (technologists) on the use of new technological media is one of the challenges facing effective and efficient administration of technology and vocational education. No one gives out what he does not have good knowledge about. It is obvious to state that instructors of technology and vocational education lack the knowledge on the use of this new technological media. Due to these poor knowledge of instructors on the use of new technological media, the objectives of technology and vocational education are not being met because of the quality and quantity of the instructors available. The instructors produced over the years have fallen short of national expectations and needs of the society due to poor knowledge of the use of new technological media, which is requisite in this changing world.

- *Lack of Skills on the use of New Technological Media:*

Technology and vocational education in this era of new media technologies requires expertise for both in the practice and the use of new media technologies for teaching-learning processes. It also requires adequate training of technology and vocational education personnel'. This required expertise is lacking in technology and vocational education. Okafor (2012) attributes this situation to the fact that early practitioners of technology and vocational education included people who did not receive any formal training in technological media. This lack of training and skills by these personnel is attributed to their inability to effectively in use new technological media in teaching and learning. Even those who studied technology and vocational education are not knowledgeable in all the new technology media usage and are not constantly trained in this regard. Regular training is the key to unlock this factor. Even the few who may claim to have fair or good knowledge of new technological media usage for the practice of technology and vocational education are seriously hampered by the unsteady power supply problem in Nigeria. Most new technological media require constant and stable power supply. This, unfortunately, has been a mirage in technology and vocational education in Nigeria for a long time. All these factors if not properly handled can put the practice of technology and vocational education in this era of new technologies in jeopardy.

- *Poor Supply of Electricity:*

Most new technological media are powered with electricity. That is, when electricity is not supplied or is poorly supplied, most new technological media become useless. In technology and vocational education workshops, there are many applications for power. Electricity is much used for training in technology and vocational education institution, especially in the workshop. However the poor supply of electricity is a great threat to the use of new

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/25may2113

technological media in technology and vocational education in Nigeria. Therefore, there should be adequate electric power supply in technology and vocational education workshop for effective practical utilization of new technological media.

- *Obsolete Curriculum of Technology and Vocational Education:*

Obsolete curriculum is one of the constraints to the use of new technological media in technology and vocational education. Okafor (2012) in his opinion emphasized that, when the curriculum of technology and vocational education become obsolete, as it is now, beneficiaries which are both students and teachers are meant to lack behind in the emergent global competitiveness and any students trained under such curriculum can never be competitive in the real world of work since students are expected to use a variety of new technological equipment. Research has shown that the curriculum of technology and vocational education lacks the inclusion of new technological media for learning. Therefore, the curriculum of technology and vocational education in tertiary institutions should be updated to meet up with the global requirements for employment.

- *Lack of Maintenance of Old Technological Media:*

Bostock (2018) stated that adequate maintenance of technological media is lacking in technology and vocational education. To him, maintenance is needed for advancement in any educational system. Despite the scarcity of new technological media, some available ones are not being maintained for use. For example, in technology and vocational education studios, there are computer systems for carrying out some educational tasks such as writing exams, AutoCAD and drafting. It is imperative to note that some of these computer systems are not well-maintained for use in school by the students. Therefore, the knowledge behind the effective use of computer systems as a new technological media will be lacking.

III. EXAMPLES OF NEW TECHNOLOGICAL MEDIA AND THEIR USES

➢ *Laptops/Computer System:*

This is used for sending and receiving information, research, virtual coaching and tutoring. They are used by students and teachers for preparing lesson plans, accessing digital libraries, conducting online research, participating in webinars, and delivering virtual tutoring sessions (Savill-Smith, 2005).

➢ *Closed-Circuit Television (CCTV):*

CCTV is used for detecting criminal acts, teleconferencing, and remote monitoring of workshops and facilities. They are used for ensuring security and surveillance within the environment. CCTV supports remote monitoring of classrooms, workshops, and laboratories. In technology education, they are used for monitoring and observing teaching methods and student responses for evaluation and feedback during lessons.

➢ *Electronic Watch Cameras:*

This is used to create a safe environment for teachers and students by monitoring, improving emergency preparedness and response. They help monitor libraries, teaching-learning processes, and detect misconduct.

➢ *Liquid Crystal Display Projectors:*

The LCD Projector enables teachers to create a bulleted PowerPoint presentation for the class. This device is used in classrooms to display digital content like slideshows, videos, and diagrams to a larger audience and helps enhance visual learning (Savill-Smith, 2005)

➢ *Electronic Whiteboard:*

This is used for different learning styles and as a tool for note-taking and teaching. It allows users to write, draw, and manipulate content using a digital pen or even by touching. Internet concepts, PDFs, videos, and live annotations can be displayed via an electronic whiteboard (Aduwa et al, 2005).

➢ *Audio-Visual Display Circuits:*

This is used for displaying information within the school premises, which serves as direction to the different parts of the school. They guide students and teachers by displaying time schedule, emergency instructions or directions to specific parts of the institution.

➢ *Television Broadcast:*

A television broadcast is used for disseminating information to the notice of both the students and teachers. This is used for broadcasting training content to multiple classrooms at once. This device is used to reinforce visual learning and stream national educational programs.

➢ *Palmtops/Telephone Gadgets:*

A telephone gadget allows connection to an electronic grade book program, to obtain test schedules via voice mail and for checking attendance records. They allow for instant communication and access to educational apps. They support learning on the go and quick access to internet resources (Aduwa et al, 2005).

➢ *Teleconferencing Network:*

This is used for online lecturing between teachers and students, scheduling meetings and for virtual distance learning. Teleconferencing enables real-time virtual meetings and classes through Zoom, Google Meet, or Teams (Savill-Smith, 2005).

IV. SOLUTIONS TO CONSTRAINTS ASSOCIATED WITH THE USE OF NEW TECHNOLOGICAL MEDIA IN TECHNOLOGY EDUCATION

Apparently, the challenges with the use of new technological media confronting the practice of technology and vocational education in Nigeria in this era of new media technologies are alarming and should not be ignored. Efforts at reducing these constraints lies in the hands of all stakeholders involved directly and indirectly in the practice

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/25may2113

of technology and vocational education. These include the Nigerian government, media organizations, corporate organizations and Non-Governmental Organizations (NGOs), individuals, as well as public and technology and vocational education practitioners among others.

➢ *Therefore, the Following are the Solutions to the Constraints Associated with the use of New Technological Media in Technology and Vocational Education:*

- Proper funding of the technology and vocational education department is very essential since money is required to offset and purchase some new technological media and for instant re-numeration of experts in technology and vocational education. In fact without money, some media equipment may damage due to lack of maintenance and may not be able to function as expected.
- There should be adequate electric power supply in technology and vocational education workshop for effective practical utilization of new technological media. Technology and vocational education in Nigeria in this 21st century should have an active website. Apart from this, the site should be updated regularly with events happening in the school especially those ones which pertain to their academics and the plan of action they intend to execute over a period of time in favour of their learners.
- The curriculum of technology and vocational education in tertiary institutions should be updated to meet up with the global requirement for employment. The curriculum should be reformed to create opportunity for training and retraining of workshop technologists on the use of new technological media
- Again, full integration and use of technological facilities such as computers, LCD Projector, electronics whiteboard and among others should be adopted for teaching in technology and vocational education institutions, especially those who are involved in training prospective teachers to promote a technology-aided learning environment.
- The Interest of the students and as well as their attitudes towards learning should be improved via the use of technology. That is, students should be encouraged to take a deep approach to learning in order to enable proper comprehension of the material, particularly when using new media technology. Teachers should also engage their students in order to encourage active participation in the learning process.
- In order to make the teaching more realistic so that they may be adopted when practicing their careers later in life, it is crucial that prospective technology and vocational education teachers have extensive training that makes use of appropriate and pertinent technological resources.

V. CONCLUSION

This paper concluded that regarding subject confidence, confidence with new technology, usage of new technology for learning, and behavioural engagements, students' attitude towards learning in a new technology-aided learning environment appears to be influenced by technology. Additionally, there is a connection between how students approach learning and how they feel about learning in a new setting that uses technology. These results, therefore, have consequences for both workshop instructors and students in technology and vocational education. Teachers will be able to package and assist students' learning using tactics that appeal to their interests by employing new technology media, which will allow them to know the preferred learning preferences and attitudes of the. These will support better academic performance as well as efficient teaching and learning. Therefore, a more effective and efficient learning environment, such as a technology-aided learning environment, will result from the active use of new technology media in vocational and technology education.

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