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## ICT Use in Technical and Vocational Subjects Teaching

<sup>1</sup>Kaka, O. A, <sup>2</sup>Nola, A.R, & <sup>3</sup>Orenaiya, J. O

<sup>1,2,3</sup>Tai Solarin College of Education

Omu Ijebu, Ogun State, Nigeria

E-mail: <sup>1</sup>kakaolatubosun@yahoo.com

### ABSTRACT

Globalization has dramatically altered how people operate in today's modern society. New information and communication technologies have altered the ways in which we live, study, work, and even define work. Although it is possible to claim that human capital drives the modern economy, the information and communication technology revolution has really made knowledge a valuable commodity. Economic growth in the modern economy is built on cerebral strength rather than physical strength, and its value is created by hiring knowledgeable individuals and keeping up with education. As a result, there are a wide range of effects on teaching and learning from integrating information and communication technology (ICT) into vocational and technical education and the educational system. ICT has a lot of promise for creating content for professional and vocational education and learning. As a result, while including ICT in the framework for educational transfer, educators must be careful. However, given that it is an invention, this could lead to the usual guidance issues that reform entails. Therefore, educators must be able to weigh the benefits and drawbacks of using ICT in the classroom.

**Keywords:** Teaching, Education, Communication, Vocational Subjects, Information and Technology

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### 1. INTRODUCTION

The enormous rise in computer and computer-based technology use over the past two decades has had an impact on educational systems all around the world. As a result, expertise in computer technology has gained more value as a teaching tool in schools, colleges, and other educational institutions. In order to make sure that teachers are equipped to deal with new technology while educating students for the workforce, the vocational and technical teacher preparation of the curriculum becomes a crucial component of this contemporary delivery mechanism. Information and communication technology (ICT) has rapidly established itself as a fundamental tenet of modern civilization.



Along with reading, writing, and math, basic ICT knowledge and values are also regarded as being a part of the core curriculum in a number of countries. According to UNESCO (2000), all countries, developed or underdeveloped, should have access to the best educational resources in order to prepare children for important roles in modern society and to contribute to an information-based society. Information and communication technologies (ICTs) are actually very important in shaping the new global economy and accelerating societal change. With the development of new and affordable methods, education may now be made accessible to all students, especially those who require continuing education to meet the demands of the information age, the rapidly changing nature of job, and lifelong learning in the knowledge society.

The use of ICT in education has an impact on all facets of the educational system; it enhances learning abilities by giving students access to cutting-edge methods, advancing and strengthening teacher preparation programs, and reducing the costs associated with traditional methods of instruction delivery. ICT can assist in bringing abstract concepts to life through images, sounds, movement, animations, and simulations. The underlying pedagogy is what matters; ICTs are merely delivery devices for teaching and learning.

In many nations, the integration of information and communication technology (ICT) into the classroom increases digital literacy. A couple of these well-liked ICT training programs are:

- Tablets: Small personal computers with touch screens that make it easier to work without a mouse or keyboard are known as tablets. Tablets can be downloaded with free learning software ("apps"), which makes reading a potent weapon.
- Electronic devices called e-readers, which can store hundreds of books, are becoming more and more popular as sources of reading material. The independence of e-readers has received positive responses from both qualified pupils and reluctant readers. E-readers have a long history, text response, and the capacity to define obscure words. E-readers may be useful when used constructively. You can also get free e-books of several well-known classics.
- Each child should have a laptop with mesh networking, low-cost operating systems, and customized programming. A 1:1 laptop program has been planned for use in schools. However, due to efforts to reduce costs, purchasing one laptop per child may not be prohibitively expensive for the industrialized world.
- Interactive white boards, often known as smart boards, let users view, interact with, drag, click, and copy predicted machine files. Additionally, handwritten notes can be created and simultaneously written on the board for later use. Interactive whiteboards are connected for training the entire class instead of student-centered tasks. The level of student participation is typically higher when ICT is employed in the classroom.
- Flipping classrooms: Through computer-guided instruction and immersive classroom learning, the flipped classroom approach enables the expansion of the curriculum to include lecture and practice at home.
- Few studies have looked into how flipped classes affect student learning. Due to their preference for collaborative classroom learning over lectures, students have a mixed, but generally positive, opinion of fluid courses.

It has been demonstrated that integrating ICT into the classroom increases student engagement, interest, and passion. ICT promotes the use of innovative curriculum materials and learning methods, the development of more engaged student collaboration, and the simultaneous acquisition of technical skills (Marsh & Pattie, 2005). Additionally, ICTs aid in sharpening discernment. Some of the most important abilities kids have gained from ICT usage are the ability to look for and compare various channels as well as structural understanding.







**Curricular and Content:** Although great focus is placed on developing abilities that enable information and communication technology-facilitated learning, its curriculum material is discovered to be the most pressing concern.

**Effectiveness and Appropriateness:** There is a common misconception that vocational and technical skills cannot be taught through distant learning. However, teaching manual skills remotely is significantly more difficult than doing so in the cognitive and emotive realms. The effectiveness of distance learning in vocational education will continue to rise through the updating and improvement of learning skills, instructional strategy, adaptive learning representations, simulation of office climate, student support systems, allowance for e-learning, and the development of intelligent training. A stronger emphasis on self-directed learning and an increase in computer learning among participants will boost remote learning's effectiveness.

**Institutional Restrictions:** In the literature, institutional obstacles to ICT-mediated learning have been well established. Some of the obstacles are as follows: lack of resources and assistance; scheduling difficulties; insufficient funding; high curriculum creation costs; instructional challenges; difficulties finding trained teachers; and difficulties maintaining dependable technical assistance and support.

**Students Obstacles:** The cost of equipment and access to skill, inspiration, the lack of immediate feedback from instructors, a lack of funding and facilities, isolation in addition to alienation, a lack of ICT knowledge, and a lack of information and time management skills are just a few of the difficulties faced by distance education students.

The children appear to be uncomfortable with ICT-mediated learning as well. In a poll conducted by the European Training Village in 2002, 61% of participants rated the general quality of e-learning as "excellent" or "poor." It's important to note that 82% of the 433 responders were from EU nations.

According to European study, students who are highly motivated and experienced are more likely than those who are enrolling in vocational education programs for the first time to benefit from ICT-mediated learning.

#### 1.4 Integration of ICT to Support Learning For Students

It is crucial to use information and communication technology for training and realistic training in Nigeria, where students have evolved superior learning methods. The cornerstone for building a learning environment and a significant source of inspiration are definitely the definitions of learning and research. The use of vocational and technical education, information and communication technology (ICT), mediated learning, Internet and intranet access, the EMIS curriculum, and other key areas for the convergence of technology and communications technology.

Information and communication technology (ICT) and computer-aided instruction (CAI) for vocational and technical teachers, as well as the use of immersive tools to create progression materials and computer-aided learning (CAL) for their students, are all topics covered by the International Conference on Technology and Mediated Learning (ICTML). Computer-assisted instruction has been adopted in other developing nations as well, particularly in the early years of education. They encourage teachers to advance by introducing new tools and interesting courseware while providing students with a variety of possibilities to develop their academic skills.

According to studies, communication is an essential component of learning. In the paradigm of the classroom, this is typically a bad thing. Most laboratory methods are "one-way teaching paradigms," where the teacher acts and the pupils passively react. Computer-assisted training can considerably supplement conventional teaching methods and make learning as simple as feasible for students.





Both the Internet and the Intranet have developed into valuable sources of data and digital services. An intranet is a private Internet for a limited number of users. As an illustration, the Internet is a global network of interconnected computers communicating over a variety of hardware platforms via protocols, whereas an intranet is a school campus network that shares local information, including teaching and curriculum, while also having access to the Internet. Any device connected to the Internet has access to the world's knowledge, but only a tiny, closed group of people, including teachers and students, can access the material of intranets.

Information on the Internet is accessible from everywhere, independent of the type of computing equipment being utilized. It also suggests that information can be gathered and/or written regardless of the subject, place, age, race, or time frame. For individuals that participate in educational activities, the Internet is also a source of incentive. A number of methods were developed to access information on the Internet, including logging onto a remote server, email lists and user groups, Internet conversation with associate personnel, and file transfer protocol data delivery from servers to the internet. The World Wide Web has drawn attention because of its usability and graphical characteristics.

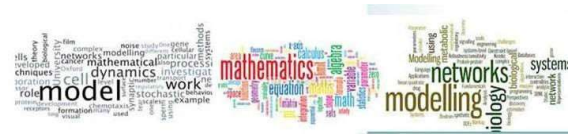
The information management system for education (EMIS/EDMIS) is a multi-user digital information system and platform for storing and retrieving educational data from colleges, grade levels, test results, schools, staff, financial institutions, and schools at the state or regional levels. Education Management Information System To aid in decision-making, data on staff performance evaluations, positions, training plans, and advanced training courses taken by employees will also be gathered in standardized formats at the graduate, national, and state levels.

Budgets, cash reserves, investments, payments, loan schedules, and other financial reports for upper-level management, along with specifics on building profiles, are all included in the EMIS financial information. EMIS is typically limited to student affairs departments at universities and ministries of education in underdeveloped countries, despite its broad use in the industrialized world. Data on educational preparedness is often gathered manually, which leaves room for error and inconsistent data.

Multimedia and telematics can support the development of a variety of skills and behaviors in vocational and technical education in a number of different ways. They will assist students in understanding how to decipher and apply the information that is conveyed in an engaging manner as applied in the learning phase. Multimedia communication and information retrieval abilities are necessary for commercial and technical communication at its most fundamental level. When using multi-media and telematics technology, students also engage in techniques that improve higher thinking abilities, such as problem-solving, reflection, recognition, and analysis since they are concerned with complicated, practical information. For students in vocational and technical education as adults in the twenty-first century, the services include training and teaching policy makers, producers, and problem-solvers.

### **1.5 The Need for ICT in Vocational Education**

Technology related to information and communications (ICT) permeates every aspect of our culture. ICT has shown to have a significant impact on the quality and quantity of instruction, analysis, and research in traditional and distant learning institutions around the world, particularly in developed economies. It is the goal of ICT to improve technical and vocational education and learning through development, immersion, flexibility, and interesting content. It makes it possible for kids to learn in a more individualized way. Additionally, IT technology has the power to deepen, enrich, and accelerate learning, inspire and engage students in the classroom, help students connect their academic learning to real-world applications, and develop the economic viability of tomorrow's workers.



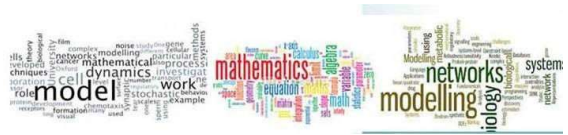
ICT thereby improves the effectiveness and performance of institutions, which leads to a variety of tools to develop and promote the pedagogical practice of technical and professional teachers. For instance, e-learning is now a common way for students to receive an education utilizing ICT (Yusuf, 2005; Mutula, 2003). While professional and technical educators should also consider their students' individual interests, as ICT-oriented technology, such as e-learning, has a lot of promise in addition to traditional education. This is due to the fact that ICT extended learning can offer fresh approaches to achieving high standards for cognitive activities, including originality, inventiveness, problem-solving, and teamwork, especially when using web-based technology.

The following are some additional, distinct, and convincing justifications for why qualified and technical teachers should use ICT technology in addition to the criteria mentioned above:

- By meeting the demands of the modern world budget, which is supported and directed by information and communication technologies, it encourages the expansion of human resources.
- A modern ICT facility enables vocational and engineering students and instructors to access, control, and utilise the knowledge on education and training environments because the Internet frequently delivers digital documents, newspapers, and similar resources (Oxfam Education Report, 2000).
- It increases the effectiveness of vocational and technical presenters in terms of providing timely advancement resources and unconditional friendliness to their students, which one can do by email reviews or other methods.
- It will encourage student and teacher cooperation and communication on both a local and global scale as a means of social interaction.
- It would change distant learning from "just in class" to "just in time," making education more easily accessible.
- No matter where they live, it would make it possible for people to work and learn at their own pace.
- A versatile user interface will stimulate the learner's curiosity since it is appealing and engaging, leading to sustained learning.
- If fully supported by e-learning experts, accessibility and distance learning programs in Nigeria and Africa would also feature a link to, mobility and collaborative work that could not be easily attended at institutions in both urban and rural populations generally. This has long-term repercussions for excellent teachers and truth-seekers in every age, location, and era. Higher education institutions offer students and teachers a flexible and open learning environment where they can advance in their understanding of modern information and communication technology.

## 2. LITERATURE REVIEW

Khan and Hadi looked into how ICT affected education (2013). It was conducted in rural Bangladeshi schools. This study sought to examine how various ICT applications might impact schooling. It was a mixed-methods investigation. The responders were picked through deliberate sampling. A small number of respondents were interviewed for ten of the points. Two categories were formed based on the organization's availability of ICT. According to the findings of the qualitative study, there were eight different variables on which the groups seemed to differ. Utilizing discriminant analysis, the predictors that significantly differed across the groups were found. For this study, 60 respondents were chosen using a stratified sample technique. According to the findings, ICT-based universities spend more money each month, guarantee a greater level of educational effectiveness, make lectures simpler to understand, provide adequate instructor output, and expedite administrative processes. However, obstacles to implementing ICT-based education include the absence of a comprehensive strategy, a lack of ICT organization, and a lack of teacher preparation.



Light (2009) looked at the use of ICT in education in underdeveloped nations. His presentation included case studies from six schools that have implemented the Intel® Teach Essentials Course, a career development program designed to incorporate ICT into project-based learning, in Chile, India, and Turkey. Variations in teachers' abilities, opinions, and boldness; variations in how students engage with content; variations in relationships between students, teachers, and parents; and variations in the use of ICT tools to promote student education were identified as the four common magnitudes of change in learning situations that occurred across nations (Light, 2009).

The effect research, which included a thorough review of the influence of ICTs on student achievement, showed that effective use of IT places considerable demands on teachers in terms of their grasp and familiarity with a variety of software to align their activities with a larger working scheme, philosophical and pedagogical. The study's methodology includes three modules: an assessment of students' performance in learning activities and skills; in-depth case studies in a number of advanced IT classes with an emphasis on classroom procedures; and a literature review (Cox, 1993). In their pilot study to identify the ICT skills needed by teachers with the eventual goal of creating learning objects that are accessible online in Malaysia, Ngah and Mona (2006) noticed that teachers thought there was a shortage of the abilities essential for incorporating ICT in their classroom education. The survey was created and utilized to gather data on a variety of topics, including: (a) demographics; (b) experience utilizing ICT for learning reasons and as a tool for learning; (c) computer attitude; (d) use of the School Resource Center; and (e) areas that require more training.

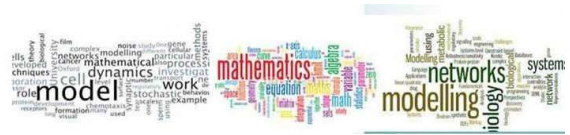
According to Lowther et al. (2008), three essential characteristics—autonomy, skills, and imagination—are needed to produce effective teaching and learning with ICT. Students can use ICT to track their learning thanks to autonomy. They can act independently and on behalf of others because of this. Teachers frequently help students do such activities in groups or with classmates. Students can acquire new knowledge about their experiences, take risks, and learn from failures through interactive learning with ICT. The use of ICT by teachers to create their own materials helps them to better oversee the course content than they can in traditional learning environments, according to Serhan's (2009) research. As students gain more confidence in their learning processes, they may be better able to use and transmit skills with consistency and efficiency. For instance, ESL students can practice their pronunciation using an online audio dictionary. The definitions and explanations of a foreign vocabulary must be studied in addition to hearing the native dictionary grammar. You are need to spell out your own pronunciation and give instances of how this new term is utilized to convey meaning.

Prior to completing the job, you must keep in mind the browser you use to hunt for an acceptable online audio dictionary. To get the online dictionary that best meets your learning needs, you must look through a variety of them. Strong coding is an additional prerequisite for these pupils in order to register their voices. As a result, the complete learning approach improves students' capacity for learning and broadens their comprehension of previously studied material. The use of ICT can enhance pupils' inventiveness. In games (Gee, 2007, 2011), CDs, and TV, you will find and create new multimedia stylistic instruments. The combination of student autonomy, capacity, and inventiveness through the use of ICTs will improve teaching and learning quality (Gee, 2007; Gee et al., 2011).

Teachers were highlighted as accelerators for ICT integration by Watts-Taffe et al. in 2003. Teachers would have an easier time creating an ICT course if the institutions have the necessary technical support, equipment, and advice. The main responsibilities of these teachers would be to alter their curricula, set up and present the most recent assignments, and organize their technology-learning experts or assistants for the machine laboratory. According to Reid, ICT provides students with additional time to examine knowledge beyond the mechanics, allowing them to comprehend topics more fully (2002).







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