

Use Of ICT In Teaching Vocational Subjects

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ABSTRACT

In today's modern world, globalization has completely changed the way of working. How we live, learn, work, and even define work has changed due to new information and communication technologies. It can be stated that human capital fuels the modern economy, but in reality, the information and communication technology revolution has turned intelligence into a valuable commodity. In today's economy, economic growth is based on mental intelligence rather than physical strength, and its worth is generated by recruiting knowledgeable workers and continuing to learn. Therefore, incorporating information and communication technology (ICT) into vocational and technical education and the educational system has a vast range of consequences for teaching and learning. ICT has enormous potential in developing vocational and professional teaching and learning content. Therefore educators have to be mindful in incorporating ICT into the educational transfer framework. However, this may result in typical guidance problems that come with reform, as it is, after all, an invention. Therefore, educators must be able to balance the advantages and disadvantages of embracing ICT as a tool.

Keywords: *Information and Technology; education; vocational subjects; teaching; communication*

INTRODUCTION

Over the last two decades, the rapid increase in the use of computers and computer-based technology has influenced educational systems worldwide. As a result, computer technology knowledge and skills have become increasingly relevant as teaching resources in schools, colleges and other educational institutions. The vocational and technical teacher preparation of the curriculum becomes a critical element of this modern delivery mechanism to ensure that teachers are prepared to deal with new technology while preparing students for work.

Information and communication technology (ICT) has quickly become an essential pillar of contemporary society. In several nations, understanding and learning basic ICT skills and values, together with reading, writing, and numeracy, are also considered a part of the core curriculum. According to UNESCO (2000), all nations, whether advanced or developing, should access the best facilities for education in order to train young people to play prominent roles in contemporary society and contribute to an information-based society. In practice, information and communication technologies (ICTs) play a significant role in determining the new worldwide economy and driving quick social change. ICT dominates the commercial world, supports contemporary businesses' achievement and at the same time, it also improves learning processes as well as educational institution organization and administration. Advancements in information and communication

technologies have made it possible to develop new and cost-effective approaches to expand the reach of education to all learners, including those who need continuing education to satisfy the demands of the information age, the fast-changing existence of employment, and life-long education in the knowledge society.

ICT in education has an impact across the educational system; it improves learning skills by providing students access to new techniques; promoting and strengthening teacher training; and lowering costs associated with conventional instruction delivery. Using pictures, sounds, movement, animations, and simulations, ICT can help bring abstract concepts to life. However, ICTs are merely distribution mechanisms for teaching and learning; what matters is the underlying pedagogy.

The introduction of computer and communication technology (ICT) into schools builds digital literacy in many countries. A few such popular ICT training applications include:

- *One laptop per child*, with features such as low-cost operating systems, special re-programming and mesh networking. Low-cost laptops have been planned for use in schools at 1:1. However, one laptop per child might not be too expensive for the developed nations, owing to attempts to lower prices.
- *Tablets*: Tablets are tiny personal and touch-screen computers that facilitate working without a mouse or keyboard. Unpriced learning applications ("apps"), which makes it a powerful tool to read, can be downloaded to tablets.
- *Interactive White Boards or Smart Boards*: Interactive White Boards enable the viewing, manipulation, dragging, clicking, or copying of predicted machine files. Handwritten notes can also be made and stored on the board for future usage at the same time. Instead of student-centered exercises, interactive whiteboards are connected for training the whole class. When ICT is used in the classroom, student participation is usually higher.
- *E-readers*: E-readers are electronic machines capable of holding hundreds of books and are increasingly used to provide reading materials. Both qualified students and reluctant readers, have had constructive answers to the independence of e-readers. E-readers include a length of existence, text reaction and the ability to define unfamiliar terms. E-readers may help in constructive usage. Many classic book titles in e-book form may also be obtained for free.
- *Flipping classrooms*: The flipped classroom model allow for expansion of the curricula, including lecture and practice at home by computer-guided teaching and immersive classroom learning. The student learning results in flipped classes are little investigated. Students have a mix of though mostly favorable, view of fluid courses, since they prefer cooperative classroom learning to lecture.

The use of ICT in the classroom has been shown to improve the level of enthusiasm and the display of greater interest and involvement of students. ICT encourages the utilization of creative curriculum tools and methods of learning to be renewed, more involved students' collaborative efforts developed and technical skills acquired simultaneously (Marsh & Pattie, 2005).

In addition, ICTs also help to improve discernment. The capacity to search for and contrast different outlets and structural knowledge are some of the most significant skills students have acquired by ICT usage. However, there are more benefits attached to it, such as:

- Their curiosity in learning increases: The usage of resources as diverse as films, websites, animations, and gaming has made even the conventional topics more fascinating.
- Interactivity: Using ICT in the course encourages a constructive and participatory attitude among the pupils, who participate in learning and want to play a leading role.

- Student collaboration: Student collaboration across different multi-media platforms is significantly strengthened. They can build team events, collaborate and learn from one another even better.
- They increase innovation. ICT instruments encourage creativity and the inventiveness of all class students.
- Increased contact: More informal and less structured communication between students and teachers is fostered through different networks.
- Personalization and up-to-date content: Interactive environment enables both knowledge and services to be updated in real-time. Furthermore, resources and materials may be adapted to local and community realities.

Vocational education is concerned with preparing students for jobs by providing them with expertise, skills, and appropriate behaviours in the workplace. Further, vocational education is defined as:

- a component of all-purpose education;
- method of planning for vocational fields and successful job contribution;
- a component of lifelong learning and citizenship preparation;
- a tool for fostering ecologically friendly sustainable growth; and
- a way of alleviating lack (UNESCO, 2000).

Professional training basically includes realistic classes in which you acquire knowledge and experience that is closely related to your potential work. It allows students to be eligible for and, in exchange, provides better employment. These courses are concurrent with other traditional studies (such as courses in a B. Sc., or M. Sc. programme). Time control and deadlines in the course of their studies play a vital part in the progress of their professional courses, and students usually generate documentation (plans, notes, sketches, images, positions) as evidence of student work skills.

Objectives Regarding the Study

1. To investigate the characteristic features of ICT.
2. To learn about the main advantages of incorporating ICT into technical education.
3. Examine the impact of ICT on students' learning styles.

Features Of ICT

In today's educational setting, information and communication technology (ICT) is commonly used. Similar resources have the possibility to transform teaching and learning and this is occurring alongside a growing understanding of the value of equipping students for our 21st-century society, with both the trust and capacity to use emerging technology efficiently and creatively in every area of their lives. Teaching students how to use the Internet to study a subject will provide them with a valuable skill that they can apply in both their professional and personal lives in the future.

In comparison to conventional approaches, a teacher who successfully uses the Internet in a lesson may have a positive influence on student engagement, teacher-student interaction, classroom dynamics, and so on. As a result, basic skills such as word processing, spreadsheets, and Internet surfing must be taught and assessed.

In the field of information and communication technology, standards are divided into three categories.

- Using ICT to visualize ideas
- Using ICT to build
- Using ICT to communicate

With ever more advanced tools, ICT integration in education grows and evolves, and participation and transfer rates to higher levels of education can increase life skills and support education. Digital literacy will be required for both children and adults at the higher secondary, secondary, and tertiary levels. Initially, incorporation of ICT into main and secondary curricular by structured guidelines is critical, as it serves as a key lever for guaranteeing ICT adoption in educational institutions and classrooms. The following characteristics assume importance:

- ICT, as an entity describes the purposes or uses of ICT in education.
- ICT as an object: It denotes to students educating about ICT in a particular development that varies by the form of education and student level. Students are prepared to use ICT in their schooling, future careers, and social lives through education.
- ICT as an assisting tool: ICT is used as a tool, separate from the subject matter to complete tasks, collect data and notes, communicate, and perform analysis.
- ICT as a medium for teaching and learning: ICT has evolved by way of a means aimed at teachers to teach and students to learn, as well as a platform for teaching and learning in various ways such as tool and practice activities, recreations, and networks of education.
- ICT as a tool for organization and management in schools: Presentation, demonstration, drill and practice, engagement, and collaboration are the five stages of technology usage in education defined by Haddad et. al., (2002). For presentations and demonstrations, any kind of ICT may be used. Likewise, drilling and practice can be done with any of the available technologies.

Challenges with Use of ICT In Vocational Education

Five main challenges are presented as follows:

1. *Infrastructure*: Appropriate infrastructure is needed to ensure content delivery and equality of access.
2. *Administration*: Sufficient resources and support for technology adoption must be provided by the system.
3. *Learning*: The use of ICTs should be for better education and awareness.
4. *Teaching*: Educators must be properly trained to instruct and support students' learning using ICTs.
5. *Content Creation*: Content development is time-consuming and expensive, and the content itself has a limited shelf life. Vocational education faces a significant challenge in developing and maintaining high quality.

While the technology-enhanced curriculum has a lot of potential, it also has some immediate drawbacks, such as capital investments in software programs and computer hardware, equivalent allowance to remove technical "haves" and "have-nots," suitable methods for mixing skill into curricular, patent problems, and a lack of educationally complete content. Moreover, for most teachers, introducing technology-enhanced learning is a major challenge because information technologies are both thrilling in their abilities and discouraging resulting from the doubt formed by the swiftness of transition.

Curriculum and Content: Although much emphasis is placed on the creation of skills that support information and communication technology-facilitated learning, what is found to be the most pressing concern is its curriculum material

Efficacy and Appropriateness: It's a widespread belief that education via distance learning is ineffective in providing vocational and technical skills. However, it is much easier to provide distance education in the cognitive and affective domains than teaching manual skills at a distance. Through the updating and enhancement of learning skills, instructional strategy, adaptive learning representations, simulation of office climate, student support systems, allowance for e-learning, and the advancement of intelligent training, the effectiveness of distance learning in vocational education will continue to increase. The effectiveness of distance learning will be strengthened further by a greater focus on self-directed learning and an upsurge in computer learning among participants.

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.

Student Obstacles: Distance education students face a variety of challenges which include: the cost of apparatus and access to skill; inspiration; an absence of instant input from instructors; an insufficient level of funding and facilities; isolation in addition to alienation; a lack of ICT knowledge; and an absence of facts and time management skills

ICT-mediated learning seems to be unsettling for the students as well. According to a survey led by the European Training Village (2002), 61% of all respondents graded e-learning's overall quality as "good" or "bad." It's worth noting that EU countries accounted for 82% of the 433 respondents. According to European research, highly experienced and inspired students are more likely to benefit from ICT-mediated learning than the persons enrolled in vocational education programmes for the first time.

ICT Integration To Support Students' Learning

In Nigeria, which has developed superior learning styles among students, the use of information and communication technology for training and realistic training is critical. The definition of learning and research is undoubtedly an important inspiration base and the foundation for creating an environment for learning. Information and communication technology (ICT), mediated schooling, Internet/intranet connectivity, the EMIS curriculum and other core areas for convergence of technology and communications technology, or the exercise of vocational and technical education. The International Conference on Technology and Mediated Learning covers information and communication technology (ICT) and Computer-Aided Instruction (CAI) in regard to the vocational and technical teachers, as well as the use of immersive tools to develop progression materials and Computer Aided Learning (CAL) for their pupils (ICTML). Other developing countries have also used computer-assisted teaching, especially in the early years of schooling. They offer students a variety of opportunities to improve their academic skills while encouraging teachers to progress with more software and engaging courseware. Communication is a crucial part of learning, according to studies. This is normally a negative thing in the classroom paradigm. The majority of laboratory models are "one-way teaching models," in which the teacher behaves, and the students merely respond. Computer-assisted instructions can significantly complement traditional instructional techniques, allowing students to learn in the easiest way possible.

The Internet and Intranet have evolved into data and digital services rich sources. A private Internet for a selected number of people is known as an intranet. For example, an intranet is a school campus network that shares local information, including teaching and curriculum, while also having access to the Internet whereas the Internet is a global network of interconnected computers communicating over a variety of hardware platforms via protocols. Any machine on the Internet includes global knowledge - (the content of Intranet is only available to a small closed community such as school-teachers and students).

Internet information, regardless of the form of computing systems used, can be seen from any place. It also implies that knowledge may be collected and/or written irrespective of the topic, location, age, race or time limit. The Internet is also a motivational forum for those who participate in schooling. Various mechanisms were created for accessing the information on the Internet, including login to a remote server, Internet communication with associate staff, email lists and user groups, and data transmission from servers to the world wide web using a file transfer protocol. Thanks to its usability and graphical features, the World Wide Web has gained attention.

The information management system for education (EMIS/EDMIS) is a multi-user information system, digital information system and platform to store and retrieve educational data from colleges, grade levels, test results, schools, staff, financial institutions, and schools, the state or regional levels. Education Management Information System Demographics, information on jobs, training plans, advanced training classes completed by personnel and staff performance assessments will also be collected in uniform formats and entry at graduate, national and state levels in order to assist decision making. EMIS financial details include budgets, cash reserves, investment, payments, loan schedules and other upper-level management financial reports as well as information on building profile. Despite its widespread use in the developed world, EMIS is frequently restricted to student affairs offices in universities and ministries of education in developing countries. Data on education preparation is typically collected by hand and is vulnerable to mistakes and inconsistency.

In vocational and technical education, multi-media and telematics can help develop a range of skills and behaviours in a variety of ways. They will help pupils learn how to interpret and utilize the information that is communicated in a creative and enticing way as utilized in the learning phase. The most essential level of business and technical communication requires multi-media communication and knowledge retrieval skills. Students also engage in practices that enhance higher thinking skills, that include problem-solving, reflection, recognition and analysis when working with multi-media and telematics technology, since they are concerned with complex, practical content. The services include training, educating policy leaders, producers, and problem-solvers for vocational and technical education students as adults in the 21st century.

The Imperatives of ICT For Vocational Education

Information and Communications (ICT) technology is an inextricable part of our culture. In traditional or distance education institutions worldwide, particularly in developed economies, ICT has demonstrated dramatic effects on the standard and quantity of instruction, analysis and research.

In ICT the development, immersion, flexibility and engaging material is all about enhancing vocational and technical education and learning. It enables students to learn in a more personalized manner. Furthermore, the IT technology has the capability to accelerate, enhance and deepen skills, motivate and engage students in learning, assist students in linking school experiences to work practice and build economic viability for the employees of tomorrow.

ICT thus enhances institutions' performance and efficiency, leading to a number of instruments to improve and promote the pedagogical practice of professional and technical instructors. For example, e-learning has become the popular mode of using ICT in education for students (Yusuf, 2005; Mutula, 2003). While professional and technical teachers should also take care of their students' particular interests, as in addition to traditional schooling, ICT oriented technology, such as e-learning, has a lot of potential. This is because ICT extended learning can provide new ways to achieve high standards' on cognitive tasks, including uniqueness, ingenuity, problem resolution, and teamwork, particularly by utilizing web-based technologies.

In addition to the requirements above, the following are, therefore, some of the clear and concrete reasons why ICT technology should be applied by skilled and technical teachers:

1. Because the Internet typically provides digital documents, newspapers and similar resources, a modern ICT facility allows vocational and engineering students and instructors to access, control and use the knowledge on education and training environments (Oxfam Education Report, 2000).
2. As a communal mechanism, it will foster collaboration and communication among students and teachers at both the international and local levels.
3. It would enable people who want to work and learn at their own rate, regardless of location, to do so.
4. It improves vocational and technical presenters' efficiency in terms of timely delivery of progression materials and provides full kindness to their pupils, which one can do by email reviews or other means.
5. It would transform distance learning from "just-in-class" to "just-in-time," allowing for greater ease of access to education.
6. Since it is appealing and engaging, a flexible user interface will pique the learner's curiosity, resulting in continued learning.
7. It promotes the growth of human resources accomplished by fulfilling the demands of today's world budget, which is financed and guided by information and communication technologies.
8. In Nigeria and Africa, accessibility and distance learning training would include, if well supported by e-learning expertise, a connection to, mobility and collaborative work that could not be easily attended at universities in urban and rural communities in general. This has long-term consequences for high-quality educators and seekers of truth in any generation, place and time. Higher schools also have a responsive and accessible learning environment for students and instructors to progress on new knowledge and communications technologies.

REVIEW OF LITERATURE

Light (2009) examined the ICT part of developing countries' educational activities. His paper featured event studies from six schools in Chile, India, and Turkey that has used the Intel® Teach Essentials Course, a career growth programme aimed at mixing ICT into project-based learning. Four common magnitudes of change in learning situations that occurred across nations were characterized as fluctuations in teachers' skills, views, and boldness; deviations in how pupils involve with content; deviations in relations among students, teachers, and parents; and deviations in the use of ICT tools to encourage student education (Light, 2009).

The effect of ICT on education was investigated by Khan and Hadi (2013). It was carried out in Bangladeshi rural schools. The aim of this research was to look into the effects of various ICT applications on education. It was a mixed methods research project. The respondents were chosen using purposeful sampling. On ten points, interviews were conducted with a small group of

respondents. On whether or not ICT was available in the organization, two groups were created. The results of qualitative analysis yielded a total of eight variables on which the groups appeared to vary. The predictors that were significantly different between the groups were identified using discriminant analysis. A stratified sampling technique was used to select 60 respondents for this study. The results indicate that ICT-based institutions have higher monthly expenditures, ensure higher education efficiency, make lectures easier to understand, ensure satisfactory teacher output, and speed up administrative procedures. However, challenges in implementing ICT-based education include a lack of a holistic approach, a deficiency of ICT organization, and the absence of teacher training.

The effect study (Cox, 1993), which included a large-scale analysis of the impact of ICTs on child performance, revealed that efficient use of IT requires significant demands for teachers in terms of their comprehension and their familiarisation with a range of software to align their activities with a broader working scheme, philosophical and pedagogical. The study methodology included 3 component modules: an evaluation on the accomplishments of pupils in their learning activities and skills; and detailed case studies in a series of high IT classes focussed on classroom processes (Cox, 1993).

Ngah and Mona (2006) noted that while access to information technologies is an issue, teachers felt that there was a lack of the skills necessary for integrating ICT in their classroom education, in their pilot research to define the ICT skills required by teachers with the ultimate goal of developing learning objects accessible online in Malaysia. The survey was developed and used for the collection of data comprising a range of components: (a) demographics; (b) experience of using ICT for the purposes of learning, as a tool for learning, (c) computer attitude; (d) use of the School Resource Centre (e) areas which need more training (Munro, 2007).

Lowther et al, 2008, reported that the development of effective teaching and learning with ICT requires three key features: autonomy, skills, and imagination. Autonomy ensures that students monitor their learning by using ICT. This enables them to act by themselves and for others. Teachers can often enable students with peers or in classes to accomplish such assignments. By interactive learning with ICT, students can build new information about their experience, take chances, and learn from mistakes. Serhan (2009) found that ICT promotes autonomy by the creation of their own material by teachers, which allows them to monitor the course content better than they do in conventional classroom environments. In terms of capabilities, students may improve the capacity to use and transmit skills with consistency and efficiency as they are more trustful in their learning processes. In an ESL, for example, students may use an online audio dictionary to practise their pronunciation. Not only do they have to hear the native dictionary grammar but they also have to study the meanings and explanations of a foreign vocabulary. You must document your own pronunciation and provide examples of how this new term is used in meaning. You must remember which browser you use to look for an appropriate online audio dictionary before completing the mission. You need to search for various online dictionaries and pick the one to best satisfy your learning requirements. Furthermore, strong coding is another requirement for these students to register their voices. Thus, the whole learning method enriches students' learning abilities and extends their understanding to what they currently learned. The ingenuity of students can be optimized by the use of ICT. You will discover and build new multimedia instruments and stylists in games (Gee, 2007, 2011), CDs and TV. The use of ICTs will increase teaching and learning quality by combining student autonomy, capacity, and imagination (Gee, 2007; Gee et.al., 2011).

Watts-Taffe et. al., (2003) identified educators as catalysts for ICT integration. The development of an ICT course would be simpler for the teachers when the institutes have guidance, equipment and required technical assistance. These teachers' key duties would be to change their courses, to set up and demonstrate the latest tasks and to arrange their technology-learning expert or helpers for

the machine laboratory. In sum, ICT offers more time for students to explore, over and above the mechanics, content which enables them to understand concepts better, as stated in Reid (2002). The use of ICT disturbs the interface between education & learning. Based on the results of Reid's research, teachers indicated that the teacher-learner partnership of information technology is often inverted. This partnership increases students' confidence as they can support teachers in the classroom with technological problems. As a result, ICT shifts the conventional teaching style and customizes and adapts its own content to enable teachers to be more innovative (Watts-Taffe, et. al., 2003).

Yildirim (2007) observed that teachers use ICT more often than to encourage analytical thought for the planning of handouts and exams. Palak and Walls (2009) have observed that teachers utilize technologies primarily to promote their current teaching methods and never encourage research that focuses on students. According to the authors, one potential reason is the lack of models for using technology to promote learning and the weaknesses of contextual variables such as class size and student ability. Brush, Glazewski and Hew (2008) have found that the training of teachers does not have enough ICT expertise to promote technology education and that it does not show adequate techniques for integration of technology within the curriculum. In pre-service instructor curricula, further experience is needed and ICT skills in a classroom are required to incorporate efficient technology strategies. Chen (2007) recommended that ICT researchers have education ideas and record explanations of how professors achieve practical and successful technology adaptation to fulfil their pedagogical objectives and help teachers deal with these problems.

Ertmer and Otterbreit and (2010) summarised the literature on the necessary elements to make ICT a practical educational method for pre-service and on-site teachers. They suggested that schools conduct strong research demonstrating the beneficial effect of teaching on student success and performance on standardized exams, focusing on technologies and a student-centered approach. For example, schools should provide teachers the opportunity to look through a range of scenarios and templates that can then be used with actual students. Schools must enable pre-service teachers to consider and effectively solve problems they can encounter when they continue to utilize ICT in their classrooms. In short, the teachers' leadership should ensure technological integration to promote ICT and not to substitute the learning and teaching phase. To create a pedagogic model, theory and application must have a close connection to help teachers address barriers to the incorporation of technology. Staples, Pugach and Himes (2014) noted that successful technological transition preparation involves a particular knowledge of relevant curriculum-related hardware and software. Staff and teacher education are often important to promote technological inclusion into the curriculum.

Expected Outcome

Many educational authorities use communication and information, and technology to raise educational expectations and improve educational quality at a sustainable and consistent pace while also addressing the new literacy targets that will be needed in the coming knowledge society. Since both students and adults would need to have a role in an organization and the labour marketplace infiltrated by ICT, developing an educational environment focused on these technologies is critical to teach and prepare the workforce. ICT has been generally praised as having immense potential for developing vocational and professional teaching and learning. However, we must be mindful that incorporating ICT into the educational transfer framework may result in roughly the typical guidance problems that come with reform, as it is, after all, an invention. Therefore, we must be able to balance the advantages and disadvantages of embracing it.

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