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4. Use of Information and Communication Technology in Teaching of Vocational Subjects in Polytechnic

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Abstract:

Knowledge and skill development may be accessed and improved at any time and from any location thanks to the dynamic role of ICTs in technical education. The study's goal is to determine how ICTs can be used to enhance teaching and learning. More than 60% of technical education teachers agreed that ICTs are vital to improving the teaching-learning process in polytechnic institutions. The findings of this study suggest that the polytechnic institute should take into account motivating variables like motivation and attractiveness while developing a teaching-learning process based on ICT. We're looking at how well polytechnic teachers use software, instructional resources, and other technological aids in their classrooms in this study. We're also looking at what factors encourage and hinder their use of these assets. The efficacy of digital devices, internet use, and the teaching and learning process is known as the digital efficacy by polytechnic teachers.

Keywords:

ICT, Polytechnic, Information Technology, Technology, Vocational Subject, TVE, Teaching, Learning.

4.1 Introduction:

An increase in ICTs has made it easier for students to learn and teach. When it comes to teaching and learning, the use of ICT can have a significant impact.

Computer have become omnipresent in our daily lives, and their applications may be found in virtually every aspect of human activity. Automated systems have taken over nearly every business function, from payroll preparation to inventory control to auditing to point of sale services; computers are being employed to execute these and many more tasks. [1]

Science, healthcare, transport, communication, and engineering are just a few of the numerous fields in which computers play a significant role.

To be sure, it is important to emphasize that computer education is increasingly making it easier for all educational stakeholders, including teachers and students, to communicate effectively during the teaching and learning process.

In our Vocational and Technical Institutions, the introduction and usage of computers will allow information to be processed more rapidly and reliably. The most trustworthy information one may obtain on a computer from anywhere in the world is found on the internet. [2]

Information and communication technology in education has been categorized into two major categories: ICTs for Education and ICTs in Education." Information and communication technology (ICT) for education refers to the development of ICTs expressly for teaching and learning objectives, whereas ICTs in education refers to the incorporation of generic ICT components in the teaching-learning process in order to improve their teaching abilities, teachers use a variety of methods. [3]

Textual information is combined with visual and auditory stimuli such as music and video to generate attractive and inspiring materials for students who actively participate in the learning process when using technology-based methods.

Using ICT educational methods, students learn to use various software programs and applications in order to better understand the information they get and to also produce new helpful resources for their learning process. Developing one's ICT abilities after graduation is obviously advantageous to one's personal and professional well-being. [4]

ICT and Exclusive Development

In both developed and developing countries, education and training systems are being restructured to meet the needs of the emerging world in the face of a rapidly changing environment.

Technical and Vocational Education and Training TVET) systems are anticipated to develop a new breed of competent workers capable of competing and excelling in a constantly changing environment and improving the economy of the country. [5] Today's technological age necessitates a significant role for TVET in the development of human capital.

The Internet/Web Environment, Overhead Projector, Opaque Projector, and/or Document Camera are just a few of the ICT teaching aids available to educators. Reward systems, increased investment by the institution in infrastructure for instructional technologies, and content development are examples of variables that stimulate technology use in teaching.

Word processors, spreadsheets, and presentation software like Microsoft PowerPoint are just a few of the various types of ICT. Tools for creating web pages, web browsers, and search engines (such as Google and Yahoo), to name a few. Only when there are no barriers to employing technology can it be considered a success. Some obstacles appear insurmountable, yet they aren't impossible to overcome.

Students and the nation as a whole could greatly benefit from the use of ICT in education, and Technical Education in particular, in the following ways:

- Interactivity enhances the performance. It improves the teacher-student relationship.
- Enhances attitude and self-assurance
- Running from one classroom to the next takes up valuable time. Teachers and students can also obtain books and other teaching and learning materials without having to leave their homes. Because of this, technical teachers are able to work more rapidly and assimilate more material.
- provides educational opportunities that would not be possible without it.

- Expand the range of options for student-driven learning
- New teaching methods are introduced in order to increase the quality of instruction and reposition students to current trends in globalization.
- Technical and workforce skills are improved.

Teachers' ICT integration skills evolve in stages, from emerging to applying to infusing to transforming. Gradually, as they progress through the system, teachers can improve growing proficiency in integrating ICT into their daily routines. [7] The diagram below illustrates how teachers' skills progress through the many stages depicted.

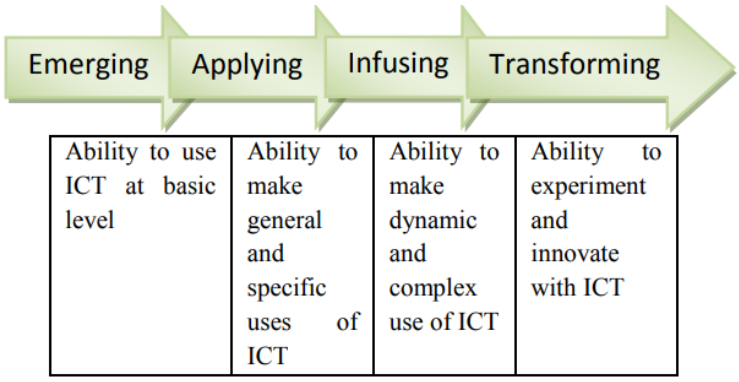

Figure 4.1: A Continuum of ICT Integration Approaches in Teacher Development

4.2 Review of Literature:

Many different forms of ICT products, such as teleconferencing and e-mail as well as televised lectures, television broadcasts, interactive radio counselling and CD ROMs, have been employed in education for diverse objectives (Bhattacharya and Sharma 2007) [8].

As a financial investment, incorporating technology into teaching is justified by the fact that ICT facilitates more efficient and effective learning outcomes for students, as well as improved performance, including academic results (Lei 2010) [9].

Shamim & Raihan (2016) [10] did a study to examine the efficiency of ICT in Bangladesh technical education, which found that ICT enhances teaching and learning since it saves teachers and students time. The educational system as a whole gain much from ICT training because of the numerous advantages it brings to areas like teaching and learning, administration, and student assessment, among others. Because of this, it is no longer as simple to teach at TVETs as it is in academic institutions to integrate ICTs.

When it comes to TVET, a multidisciplinary approach is often required, as opposed to the narrower focus of academics. As shown by (Tella et al., 2007) [11], the school's management performance and communication processes among educators, administrators, parents and students improve when these basic skills and knowledge are in place.

The ability to use the internet effectively encourages teachers to collaborate in online knowledge enhancement through educational platforms and search engines (i.e., Google, wiki,) in order to enrich their students' classroom experience with fresh knowledge, developing their skills, and problem solving when modelling and simulation are used in TVET classrooms teaching problem solving and problem solving (ibid).

Newer generations of ICT users (Chai et al., 2017[12]; Göksün & Kurt, 2017[13]), as well as pre-service teachers' skills in teaching and learning processes, are critical to enhancing conditions for incorporating digital technology into TVET programs.

According to the present needs of Sudanese TVET teachers, they were divided into three phases in this study. The developed world will be able to attain standardization if these procedures are implemented.

4.3 Objectives:

- In order to determine the value of ICT in technical and vocational education
- To figure out how to teach students how to utilize computers.
- To figure out ways to better manage and maintain computers at vocational/technical schools, so that they can be more effective.

- To find out how the government, the media, parents, educators, and everyone else involved in education may be made aware of the importance of implementing policies that encourage the wide use of computers.

4.4 Research Methodology:

Research technique is a methodical approach to tackling a research topic. Another way to think about this field is as an investigation into how scientific research is carried out. The logic behind the numerous procedures taken by a researcher to analyse his research problem is examined in this article.

Research methods and procedures are only half of what a researcher needs to know; he or she also has to understand research methodology. Based on secondary sources such as books, journals, academic articles, government publications and printed and online reference materials; this study is descriptive rather than prescriptive in character.

4.5 Result and Discussion:

It is obvious that institutions lack the technical ICT competence to establish explicit strategies for the continual development of their ICT infrastructure, which is a major technical problem for most institutions trying to successfully incorporate ICT into learning and teaching.

Many reasons contribute to the underdevelopment of TVET: inadequate infrastructure; corruption; high implementation and funding costs; poor public awareness; a scarcity of skilled workers; cultural considerations; and a lack of government policies encouraging the use of new technologies. [14]

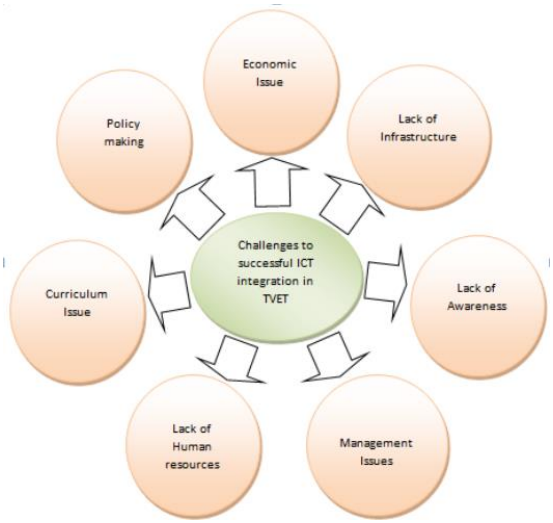

Figure 4.2: Challenges to successful ICT integration in TVET

The TVET training cycle can be linked to seven (07) primary system components/functional areas to evaluate the efficient integration of ICT in TVET. Figure 4.3 depicts these elements in further detail. [15]

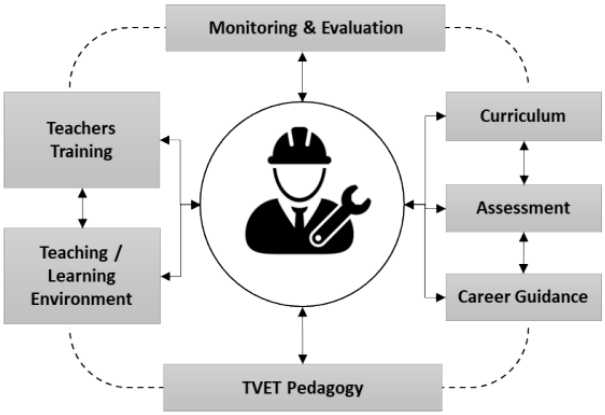

Figure 4.3: TVET training cycle major system components/functional areas.

Figure 4.4 depicts a visual representation of the technology index. COVID-19 pandemic has made online training more important in the previous two years. Industry 4.0 and 5.0 industry revolution technologies like Robotics, Artificial Intelligence, Big Data, Data Science, Recommender Systems, Nano Technology, Cloud Computing, and IoT, etc. are very less focused. Television and Vocational Education and Training's future is built on these technologies. [16] In order to fill this gap, TVET training providers, policymakers, business and academia will have to work together to make sure that this is done.

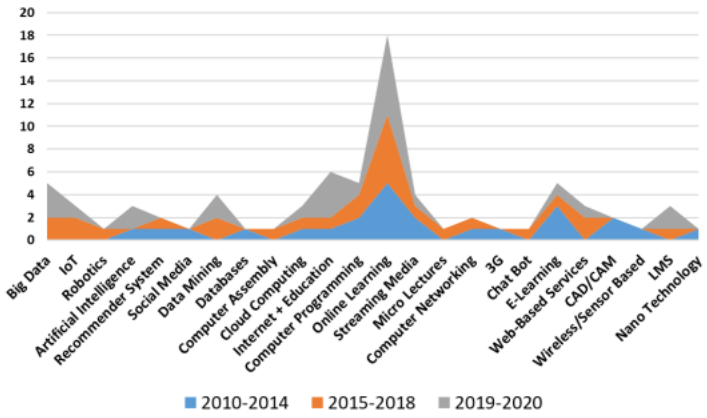

Figure 4.4: Technology penetration three clusters.

The response regarding ―ICT is very helpful for improving the techniques of T-L process in TVE‖ is Strongly Agreed (WA= 4.66), which indicates that the response is significant. The responses regarding ―Using ICT, Teaching- Learning will be easier, interesting and time saving‖ is Agreed (WA= 4.40); that indicates the response is significant. The response regarding ―Students will be more motivated to learn if ICT tools are used in TVE‖ is Strongly Agreed (WA= 4.50); it indicates that the response is significant (Figure 4.5)[17]

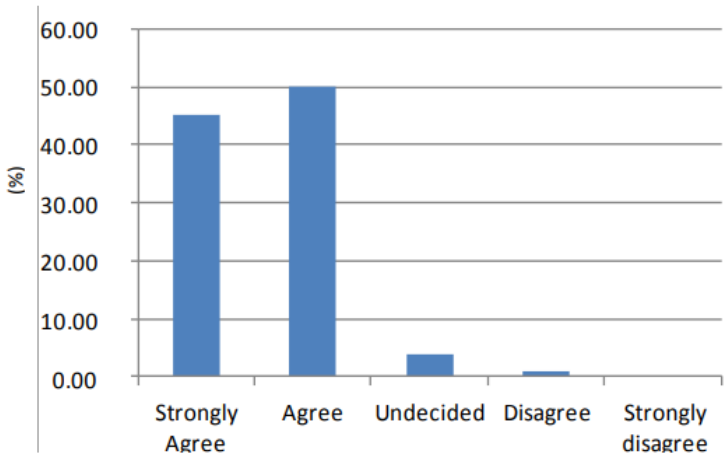

Figure 4.5: Using ICT, Teaching-Learning will be easier, interesting & time saving.

The results show that every aspect supports the use of ICTs for effective and efficient teaching and learning. The majority of teachers said that it saves time, is simple to motivate students, and is cost-efficient. [18]

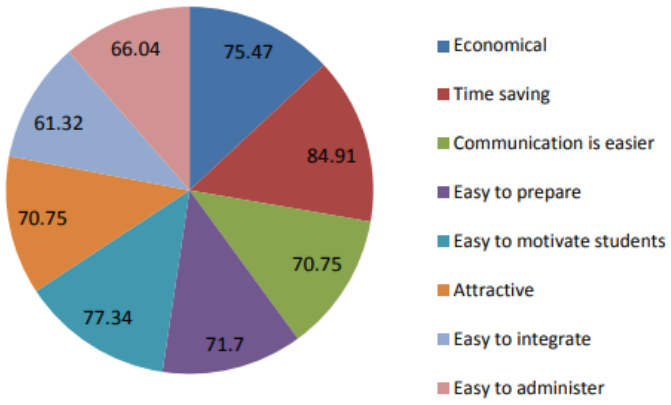

Figure.4.6: Opinion's on the factors stimulating to use of ICT in teaching-learning.

Using ICTs to communicate in the classroom is simple, attractive, and has a significant impact on the usage of ICT in technical education, according to the teachers. [19] According to the teachers, ICTs are easy to manage, easy to integrate, and have a significant impact on the usage of ICTs in technical education.

4.6 Conclusion:

When it came to word processing skills, teachers were more likely to utilize computers than any other profession. As a result, spreadsheet and database skills, as well as file management, were the primary ICT skills teachers had. Only social media, not the internet, was used by respondents when searching for information on themes and things that may be used for lesson planning or course design and syllabus for their students.

The findings of our research strongly suggest that, as a priority work, the preparation of technical and artisan institutions, as well as vocational training centers with sufficient computer devices, as well as internet connectivity, such as WLAN service, should be taken into consideration. ICT training should be integrated into certificate and diploma programs to enable pre-service teachers to acquire the necessary skills. In-service teacher training, workshops, and seminars should be held to bridge the gap between teachers' ICT skills and to allow teachers to interact and share their experiences and efforts, above all, there should be a much defined curriculum for teacher training program characterized by international standards.

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