

# Adoption of Information and Communication Technology (ICT) in Tanzania Vocational Education and Training (VET) Industry: A Catalyst for Vocational Education and Training Effectiveness and Employment Opportunities?

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## ABSTRACT

*The study was done in Vocational Training Centre. General Objective is to investigate the extent adoption of ICT influence instructors'/learners' competencies and employment. Specific objectives were to investigate instructor's professional development, knowledge and skill development in ICT and programmed contents and to determine benefit gained by using ICT in instruction and in employment. Survey research design was adopted. Interviews, observation and documentary review data collection methods were used. Data collection instruments used were interviews questions, questionnaires, observation and documentary review guides. Software Package for Social Sciences (SPSS) was used to analyze data. The study revealed that respondents 90(78%) attended professional training on basic applications including introduction to computers. Other courses included Ms Word processing attended by 70 respondents (58.3%), Ms Excel attended by 35(28.2%), presentation of software attended by 26(21.7%) and respondents 30(21%) attended training on integration of technology into curriculum. Findings on ICT Knowledge and skills revealed that respondents 36(36%) have good skill in operating Word Processing Application, 32(32%) were good in file handling, 32(32%) had moderate skills on operating systems, 32(32%) had moderate skills in the area of using web search engines and 54(54%) cannot use database application and Computer Assisted instruction programs. Findings revealed that there were achievements from using ICT during instruction and students' learning. Benefits from ICT adoption included increase of curiosity among trainees, creativity among trainees/instructors and team work/collaboration improvements. There are few employment opportunities for VTC graduates. Conclusively, adoption of ICT catalyzed VET delivery. The recommendations include: ICT budget increase and improvements of ICT environments.*

**Keywords:** ICT, VET, Instructors, Trainees and Employment.

## INTRODUCTION:

Tanzania, like other sub-Saharan countries, is striving to improve the prospects for development through rigorous and wide-ranging reforms in all parts of her industries through provision of quality, knowledgeable and skilled education. The government through Education Policy (URT, 2014) conceives VET to be very effective in knowledge and skills essential for achieving Tanzania industrialization philosophy. (Kanyeri, 2015) contends that VET faces many barriers which include linear technological change, high costs of facilities and equipments, financial constraints, inadequate laboratory facilities and traditional instructional techniques. Thus, ICT may be a

solution to these issues and act as solution for improvements of VET industry. It is therefore contended that when looking at the current widespread diffusion and role of ICT in modern societies, especially by the young - the so-called digital generation - then it should be clear that ICT will affect the complete learning process today and in the future. (Honey, McMillan, & Carinf, 1999) observe that ICTs are also used to support the education system in areas such as administration, communication and curriculum development

A survey report on meta-analysis of ICTs integration in VET in Southeast Asia showed that, the use of ICTs is not only an option but also a necessary catalyst for enhancing the delivery course materials to reach wider audiences and to make the instruction-learning processes more effective (OECD, 2001). It is also contended that the employment of ICT is considered as an important tool to accomplish Education for All (EFA) and in this regard, VET is one among the education components. In Tanzania, ICT in education context is broadly indulged in the communities and this has been opening new opportunities for people on a daily basis and the government is optimistic that applying ICT to empower education, and learning about ICTs in schools, is a necessity in order to overcome the challenges faced by the education technological influence.

International best practice shows that the end-to-end model which addresses the key components of policy and planning, infrastructure and deployment, curriculum and content, training and usage, maintenance and support and monitoring and evaluation provides for a comprehensive approach and an enabling environment for ICT integration during learning (Kissima, 2010). Unpublished tracer study done by (Mwakapugi, 2004) revealed that 17%, of graduates from VET training institutions in the electrical courses lacked practical skills. Findings also revealed that 60% of graduates felt that the curriculum was outdated due to rapid advancements in technology and that have impact on graduates on course of competencies demonstration in the industries.

In light of these, (Ramsay, 2000) revealed that the diversity of using ICTs in industries is placing proportional demands for ICT to be integrated across the VET courses. Also, from the student's perspective, the desire to position oneself for the new types of jobs including the demonstration of technological competencies provides a strong incentive to mix study programme options and qualifications, often beyond the traditional institutional boundaries. Kissima (2010) in unpublished document provides example that the design, the manufacturing, and the printing sectors have also been transformed in major ways. Many machines that were manually or mechanically operated and controlled for a long time are now controlled by Information Technology. In the machining trades, Computerized Numerical Control (CNC) has replaced traditional setups and processes. Computer-Assisted Drafting (CAD) has replaced much of traditional hand drawing. In the printing trades, computers are replacing light tables and artists knives.

Kissima (ibid) contends that the key player to the economy development, VET graduates have been struggling to respond to the need of the customers and market demands. A study conducted by (Jones, 2002) revealed that businesses and industries have experienced dramatic transformations as a result of the exponential growth of ICTs. For example, the transportation industry has seen massive computer integration into their operating systems. Some vehicles use three or more computers to control different onboard systems. Separate computers are being used to control the engine, transmissions/transaxle, instrumentation, and climate control, suspension system, and antilock brakes. (Mutarubukwa, 2006) conducted a study on training of trainees in vocational training centres and revealed that traditional techniques of teaching theory and practical was perceived to be out of date. He recommended the use of ICT for training quality improvements.

According to (Erjavec, 1996), today's automotive technicians must not only update themselves with changes in automotive technology but must also keep up with new equipment and procedures. In modern automotive repair shops, workers must use computerized diagnostic tools to diagnose problems and make repairs. Other information technology systems provide access to technical service bulletins, manufacturers, service information, and inventory databases.

In line to this, (Lynch, 1998) explains that the manufacturing sector has also been dramatically altered by ICTs. Many technology-based processes have been implemented in manufacturing such as computer numerical control, computer-aided manufacturing, computer-aided design and computer-integrated manufacturing. Since many VET training institutions cannot afford to buy this equipment, industries and businesses suffer as graduates are not able to operate or damage the machine. Efforts to promote the ICT environment in Tanzania include the adoption of National ICT policy, which among other issues recognizes the role of the education system in nurturing ICT skills for future labour markets.

In this regard, Vocational Education and training authority (VETA) which is responsible for VET provision has developed ICT Policy and Master Plan (Based on National ICT policy) to make sure administration and training activities use ICT effectively. The use of ICT in VET system by developing curriculum for ICT to be trained as crosscutting subject, whereby all trainees should attend. The introduction of the curriculum has triggered an

increase of ICT equipments, capacity building for instructors and more access to the Internet. Furthermore, the need for ICT skills in VET institutions arises due to the fact that, many facilities and equipment which were traditionally manually or mechanically operated and controlled, are now controlled by Information Technology. However, the mismatch between the availability of ICT facilities and equipment and effective utilization of ICT during instruction and students learning is a gap which this study bridged.

**RESEARCH OBJECTIVES:**

The general objective of the study is to investigate the extent ICT adopted enhanced training in VET institutions and the extent created employment opportunities to graduates. Specifically, the study assessed the competencies of VET instructors to train by using ICT in VET centres; determined factors hindering the use ICT in VET centres, identified ICT training contents used to train trainees in all skill occupations in VET centres and assessed merits of using ICT in VET institutions.

**LITERATURE REVIEW:**

**Theoretical Literature:**

**ICT in Global Perspective :**

Globalization has generated new necessities, ideologies, methods, and ways to understand communications in all aspects. ICT is crucial for all governments in the world towards promoting equity and enhancement of the quality of education. In this regard, ICT has been considered a low cost opportunity towards equalizing educational systems. There are four pillars of education in vocational education and training through ICT: hardware and software, access to internet, competencies and skills, and content of the material (Magyar, 2004). Raising the level of low achievers is crucial for all countries if they aim at raising all students’ educational achievement since the potential gains are greater for those students in any educational system. The widespread access to ICT in the past decade increased hopes for improving student learning (OECD, 2001). ICT connects information, products, people, ideas, individuals as well as communities globally at a relatively low cost. All countries insist the importance of preparation of younger generations with ICT skills in their education policy documents. ICT brings new structures in learning. More so, ICT skills are needed in today’s World.

**ICT in the Contemporary Education Industry:**

ICT is changing the developing World’s attitudes and approaches to education provision, measurement and evaluation. By transcending traditional physical and spatial constraints, ICT brings to millions of people of all ages, ethnic groups, and socio-economic levels unprecedented educational opportunities whether they are on campus or off campus, attending vocational institutions, or receiving VET at a distance; whether they are fully or partially employed; whether or not they are physically disadvantaged; and whether they live in dense urban or in remote and rural communities. In terms of access, ICT, properly utilized and promises the ultimate democratization of education.

Furthermore, ICT is able to do this in a cost-effective, sustainable way and thus, the more learners participating in a technology mediated program, the lower the per-student cost. Historically, there has been an inverse proportional relationship between technological capability and cost. Loxley and Jullien (2004) explain that ICT is effectively adopted only if perceived by instructors as making sense and being advantageous in their work. Though some guidelines and priorities are essential, flexibility is necessary to foster creativity, experimentation, and innovation approaches.

In that sense, the effort of (UNESCO, 2009) in setting up norms of competences in ICT for instructors is understandable. On course of improving the quality of education in educational institutions, UNESCO set approaches which include: Increasing the technological uptake of the workforce by incorporating technology skills in the curriculum-or the technology literacy approach; increasing the ability of the workforce to use knowledge to add value to economic output by applying it to solve complex, real-world problems- or the knowledge deepening approach; and increasing the ability of the workforce to innovate and produce new knowledge and of citizens to benefit from this new knowledge- or the knowledge creation approach.

(Bennett, 2002) questions whether educational institutions would ever implement the potential for learning that ICT offer. He argues that more effective education would result only if citizens, educators and policy makers conceive the extent computers could be used in extensively in educational institutions and software designers would produce useful software: until education institutions can permit a major alteration in the way instruction is carried on, they must continue to miss out on the improvement that ICT can bring.

Countries throughout the World regard ICT as a core component for learning (Anderson & Van-Weert, 2002). The use and integration of computers and ICT in vocational education and training provide students with important skills applicable to computer related tasks. To be introduced in schools of vocational education and training, software must be adapted to the curriculum. The more it deviates from the concrete needs of programs and teachers, the less likely it is to be implemented, regardless of its quality or degree of innovativeness. Ignoring the needs of teachers and the dynamics of schooling introduces a risk similar to what happened to instructional television.

By denying the importance of television as a teaching/learning tool, educators failed to produce interesting programs. According to (Dike, 2002), ICT in VET is conceived as a systematic arrangement of instruction in such a way that learning is facilitated and help the learners to interact individually or in groups for learning to take place. It is easy delivery of a lesson by the teacher and help learners to learn faster, better and at their own pace and place and broaden students' knowledge and level of understanding.

### **Theories which guided the Study :**

The following were theories which guided the study

#### **Vygotsky Social and Constructivism Theory:**

The theory advocates that Learning in a socio-cultural environment and insists the importance of language (especially talk). It stipulates the significant others': more knowledgeable and zone of Proximal Development (ZPD). It is advocated that ICT may be seen as mediating learning (ZPD), impact on interactions and relationships: teacher-pupil, pupil-teacher and pupil-pupil. ICT also shifts the balance of power, importance of interpersonal (social) exchanges during learning and computer-mediated communications via the internet: implications for learners.

In view of the limited availability of intelligent software, learning is as, if not more, likely to take place via the interactions of pupils with peers and the teacher while using ICT applications as it is via the interaction with ICT itself (Patcher, 1999).

#### **Behaviourist theories:**

The theory is associated with a 'traditional' model of learning as 'conditioning' i.e. behaviour as responses to stimuli – an individual responds to a stimulus by behaving in a particular way. The theory contends that reinforced by reward/punishment and link to motivation: extrinsic/intrinsic as well as adult 'expert' responsible for teaching. The theory emphasized computer-based 'instructional' programmes which are learning broken down into small steps; model the role of the tutor, input - 'drill-and-practise' - test – feedback. The theory assumes repetition beneficial/essential and that computer doesn't get bored.

#### **ICT and Learning Theories**

Effective use of ICT for teaching and learning in schools and universities is not widespread, even though the technology is now almost ubiquitous. Some teachers and lecturers have been able to integrate ICT use into their teaching, and more importantly engage students in making use of ICT as part of the process of learning. However, there are still many barriers and impediments in the way of ICT becoming an integral part of teaching and learning. Some of these impediments will be discussed, with a special focus on beginning teachers and ICT (Jones, 2002). The progress report from contains lists of faults including: ICT tasks not related to objectives of lessons; lack of guidance by teachers, lack of knowledge about when to use and when not to use ICT, lack of teacher skills and confidence, lack of appropriate intervention by teachers; and lack of recognition of student expertise in ICT. Although these comments are negative, they provide information that is crucial to those responsible for designing and implementing teacher education programs that aim to change the current state of educational use of ICT. It must also be noted that the report contains many positive examples of effective use of ICT by schools and individual teachers.

#### **The Integration of ICT into Instruction and Learning:**

(Moore, 2001) and (Brown, 1999) explain that reaching a wider audience is a strong motivator for translating coursework into electronic formats. Faculties, often apprehensive that a class may be cancelled due to lack of enrolment, are seeking ways to cast a "wider net." TVET draws its foundation from technological innovations and that the challenge was the extent TVET stayed as abreast of technological developments in industries for the sake of ensuring all graduates are capable of demonstration of their occupational competencies (Chinien, 2003). TVET educators have developed initiatives to equip workshops with the latest technological innovations. On this, (Zewinski, 2002) argues that there has been further integration of information technology on the shop floor through the Ethernet and more recently, the Internet which are used to store and retrieve data and provide communication among programme able devices. In this regard, new technologies, such as a computer, promises rich education experiences. (Kasworm & Londoner, 2000) on ICT highlight that technology compliment

instruction and the emphasis is on providing opportunities to practice skills taught and extending learning by working with specific software applications.

**Barriers to ICT implementation:**

(Kupsh & Mason, 1986) discuss barriers to the implementation of technology. (Glenn, 1997) contends that the organizational structure of schools inhibits teachers, efforts to learn new technologies and resist innovation, for example, the limited amount of time available to teachers to learn new technology. The major issues in the implementation and integration of technology in teaching and learning includes resistance to change to something new (teacher, student, and school), teachers, attitudes, training, time, access, and cost. (Dike, 2002) explains that the barriers to the use of the Internet and computers for instruction included lack of computers, lack of release time for teachers to learn how to use technology, and lack of time in the school schedule for student computer use.

(Sand, Prodeck, & Y., 2008), contend that the knowledge of computer technology and computer-based technology has become tremendously important to technical and vocational teachers in the new information age. In this case, vocational and technical instructors have realized the value and usefulness of computer technology in their programs. However, they do not have the necessary skills and knowledge to use it effectively for instructional purposes. In order to ensure that technical and vocational education will remain valuable to the educational system, vocational and technical programs must continue to enrich the programs to prepare students for the workplace and society. In order for instructors to do that, they must continue to value computer technology and seek ways to connect program and instructional management with appropriate computer technology, especially the Internet. (Bitner & Bitner, 2002) on barriers to successful ICT implementation into education and training discovered that skill and attitude of the instructor determined the effectiveness of technology integration into the curriculum.

**Empirical Literature:**

Un-published studies from several countries suggest that in general teacher education has not been able to keep up with the pace and scope of technological change in schools and society. Such studies have been reported from Australia (Ramsay, 2000), the UK (McKinsey, 1997), and the USA (CEO Forum, 1999). In the Australian state of Victoria, stated government policy is that both primary and secondary schools should aim for a ratio of 1 computer used for teaching and/or learning for every 4 students. The designated curriculum states that ICT use should be integrated into all curriculum areas and not be taught as a separate subject until middle secondary school. While schools work towards achieving these goals, there are no equivalent statements or aims for teacher education.

(Chomienne, 1990) from his study revealed out four pedagogical applications of computer technology: Computer as a technical tool for teaching, computer as a teaching tool (teaching aid), computer as a working tool for the students (professional tool) and computer as a control system tool or laboratory and workshop tool. ICT was also revealed from the study that computer technologies are developing at a rapid pace, carrying the potential to deliver vocational education to more learners in more satisfactory ways. He recommended that vocational education instructors should be encouraged to participate in professional development activities to acquaint them with the uses of computer technology for improving teaching effectiveness.

He also noted that vocational and technical teachers will continue to be challenged by these new technologies and must be able to use these new technologies that are continually changing the ways how people live, work, and learn. On issues influencing effective computer based technologies in education context, Wanocott (2001) discovered that computer shyness among instructors and learners have been obstructing them towards gaining competencies on given occupations when learning skills. He recommended the improvements through provision of on job and off job regular training on ICT.

Similar un-published study done by Kalengen (2016) revealed that technology-based learning environments help students to gain competencies in a number of aspects. Findings revealed that students acquired type of knowledge, skills, and attitudes needed for learning. The findings are equated with researchers' experiences experiential learning activities through formalized software and computerized movies with interactive check sheets, and practice activities for developing decision making, problem solving, and management skills. (Joneses, 2016) from un-published study revealed that approaches in current use for stimulating practical skills using ICTs are online learning, simulators and virtual reality.

It was revealed from the study that pilots, truck drivers, and crane operators may spend more training time in a virtual reality environment and in simulators than with the actual equipment to reduce hazards and equipment rental costs. A study done by Watson (2001) revealed that IT is not only perceived as a catalyst for change, but also change in teaching style, in learning approaches, and in access to information. The study revealed that

teachers were both threatened by technological change, and conclusively not impressed by change that appears to focus on what the technology can do rather than on learning perspective. It was revealed from the study that the reason for many of the failures in educational uses of ICT relate to an over emphasis on the technology to the detriment of the pedagogy.

**METHODOLOGY:**

The study was done in Tanzania VTCs and both random and purposive sampling methods were employed to get five VTCs. Survey research design was employed and random as well as purposive sampling techniques were used to get 120 respondents from a population. The sample consisted 100 instructors and 20 administrators. Both qualitative and quantitative research approaches were employed during the study. Data collection methods used were interviews, observation and documentary review were data collection methods used to collect both primary and secondary data. Both structured and unstructured interviews were administered to all respondents. Data collection instruments used were interview questions, questionnaires, observation guide and documentary review guide.

Content analysis was used during data analysis In this case, analysis of data begun with individual responses then responses from different respondents were sorted and grouped together and this resulted into differentiation of same or different responses. The Statistical Package for Social Scientists (SPSS) computer software programme was used for effective data analysis.

**FINDINGS AND DISCUSSION:**

The following were findings and discussions based on research objectives.

**Professional, Knowledge, Skill Development in ICT and Programmed Contents:**

Data in Table 1 below indicates responses on attendance of formal trainings of computer programs. In this case respondents (N=120) provided responses for each variable in the table.

**Table 1: Respondents’ Responses on Attending Professional Development**

| S.No. | Variables   | YES       | NO         |
|-------|---|-----------|------------|
| 1     | Training in the use of computers / basic computer             | 90(79%)   | 30(21%)    |
| 2     | Word processing (eg. MSWord)                                  | 70(58.3%) | 50(41.7%)  |
| 3     | Spreadsheets (eg. Excel)                                      | 35(28.2%) | 85(70.8%)  |
| 4     | Presentation software (eg. PowerPoint)                        | 16(21.7%) | 104(78.3%) |
| 5     | Databases (eg. Access)  | 22(18.3%) | 98(81.4%)  |
| 6     | Training on how to integrate technology within the curriculum | 30(21%)   | 90(79%)    |
| 7     | Simulation programs   | 42(35%)   | 78(65%)    |
| 8     | Software related to the occupation (e.g. CAD/CAM, CIM)        | 12(10%)   | 108(90%)   |

Source: Field data 2017

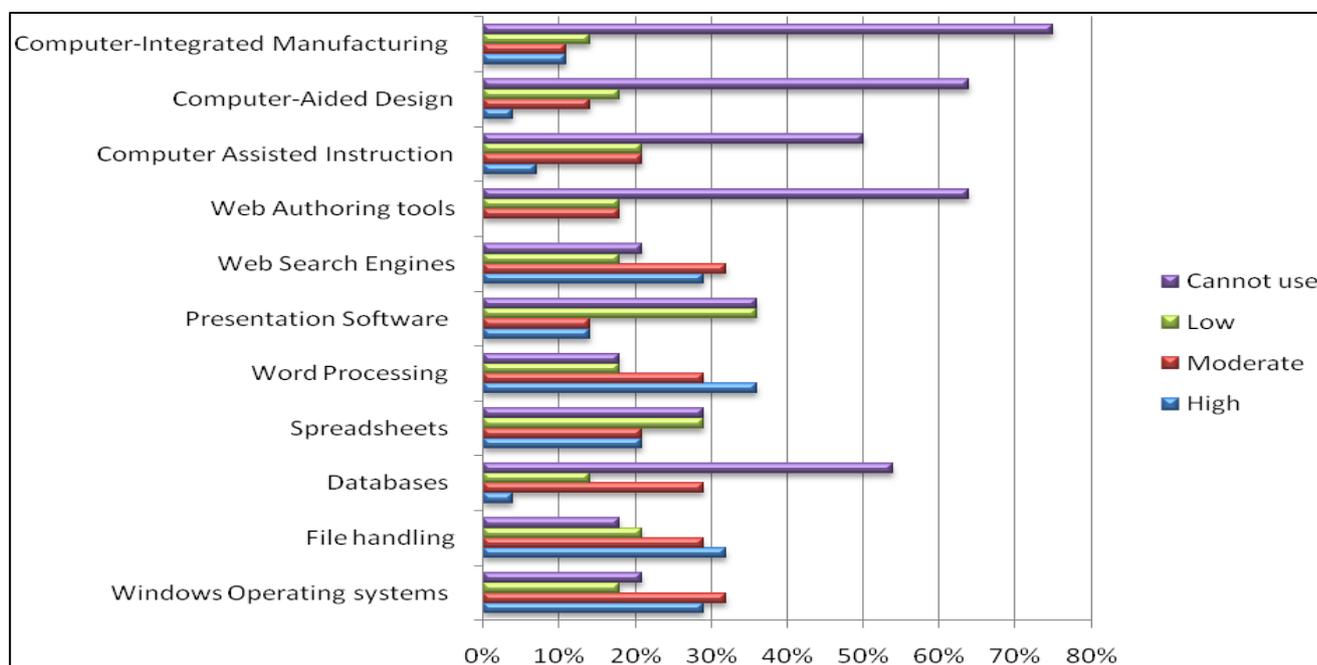
Generally, data in Table 1 shows that a good number of professional training was on basic applications such as introduction to computers and that 90(79%) of respondents agreed and respondents 10(21%) disagreed. In Ms Word processing (Word) respondents 70(58.3%) agreed to attend and respondents (41.7%) disagreed. For Ms Excel (spreadsheet) respondents 35(28.2%) agreed that they attended professional development and respondents 58(70.8%) disagreed to have attended. In this regard, researchers conceived this to be a very big problem specifically to instructors because competencies on Ms excel in assessment is used to compute to compute and standardize scores as well to perform various calculations for example in electrical, motor-rewinding and mechanical trades.

This is in line with (Bitner & Bitner, 2002) who contend that computer knowledge and skills are important applications because serve as teaching and teachers use database to manage students’ learning results. Another problem was revealed on the presentation of software (eg. Power point) whereby only respondents 26(21.7%) agreed to have knowledge and skills and the majority of respondents 104(78.3%) lacked such knowledge and skills. The implication of this is that instruction of theory subjects was dominated by traditional way of instruction which cause difficulties among learners to deeply conceptualize occupational concepts. The revealed that respondents 30(21%) agreed that they attended training how to integrate technology within the curriculum and the majority of respondents 90(79%) did not attend. This was also discovered to be a problem with regard to programmed delivery since it facilitates improvements in the

quality of instruction and hence, learner’s good performance. Data in table 1 indicates that respondents 42(35%) agreed that they attended professional programs on simulation and respondents 78(65%) disagreed, and respondents 12(19%) agreed that they attended professional training on software related to the occupation (e.g CAD/CAM) but respondents 108(90%) disagreed.

On ICT knowledge and skills, instructors (N=100) were asked to indicate their skills levels on four points scale from cannot use to high. Figure 2 indicates results. Findings indicates that 36(36%) of the respondents mentioned that they have good skill in operating word processing application (Ms Word) and 32(32%) of the respondents mentioned that are good in file handling (creating/opening files, copy etc).

**Figure 1: Computer application by skills level of Respondents**



Source: Field data 2017

It was also revealed from the study that 32(32%) of the respondents admitted that their skills were moderate in understanding operating system such as Windows and others. Furthermore, 32(32%) of the respondents mentioned that, they had moderate skills in the area of using web search engines such as Google, Yahoo, and Bing etc. Over 54(54%) of respondents indicated they that cannot use database application, 54(54%) of the respondents admitted cannot use Computer Assisted Instruction program. It was also revealed from the study that 64(64%) of the respondents mentioned that they cannot use two applications Computer Aided Design/Computer Aided Manufacturing and AutoCAD and 75(75%) of the respondents stated that, they have no skills of using or operating Computer Integrated Manufacturing program.

With regard to the findings on ICT training Programs (contents) indicated in Figure 2, findings revealed that respondents (only instructors), 98(98%) said that they have attended introduction to computers, respondents 84(84%) attended Word Processing (Ms Word) and respondents, respondents 72(72%) attended programs on spread sheets, 60(60%) were not trained on how to use Internet searching (using browsers) and respondents 72(72%) admitted that have not attended training on presentation application Ms PowerPoint. Furthermore, the study revealed that majority of the trainees have not studied applications which are related to occupation specific ICT literacy; 94(94%) of the respondents explained that they have not attended training in Computer Integrated Manufacturing application, and at the same rate of 94(94%) of the respondents said have not attended Computer Assisted Instructions programs. 90% of the respondents have not studied Computer Aided Design and lastly, 78(78%) of the respondents responded that trained on how to use web authoring tools (Photoshop, Premier, and AutoCAD).

In a nutshell, findings are congruent to the findings in similar research in other areas. For example, challenges of using computer technology in education include lack of instructor’s time, limited access and high costs, lack of vision or rationale for technology use, lack of training and support, and current assessment practices that may not reflect what has been learned with technology. Also Kissima (2010) note that the very major challenges in

integrating ICT in education are lack of funds for ICT infrastructure or/and facilities as well as poor electricity supply, In this study, VTCs are investing much in ICT at that rate of 20% increase annually in total budget (VETA, 2017). In light of this, the national budget increase for the Ministry of Energy from 21.5% in the year 2013 to 46.9% in the year 2016 (Kanje, 2017) have been ensuring stable electricity supply in VTIs and hence, effective utilization of ICT facilities and equipments during instruction/learning. Benefits gained by using ICT in instructing vocational subjects and employment

Generally, findings revealed that there were achievements from using ICT during instruction and students' learning. The use of ICT resulted into instructors and learners to be creative and developed their curiosities, improved students' independent learning rate. It was revealed from the study that respondents (45%) admitted that ICT resulted into team work among instructors and students during instruction/learning process and ICT highly assisted them to analyze and solve problems and improved their communication skills. It was further revealed from the study that ICT assisted instructors in examination scores. It was also revealed from respondents (68%) that in Tanzania context, very little ICT have been supporting to bring opportunities for employment after graduation.

In a nutshell, these findings are valid since ICT proficiency is geared at the pivot of learning required skills which is also in line with the integration of ICT literacy by validating technology for student to perform operations in a given occupation. This is in line with Kissima (2010) that it must encompass the use of ICT to manage complexity, solve problems and think critically, creatively and systematically towards the goal of acquiring thinking and problem-solving skills. A finding also in line with the fact that the outcomes of computer simulations are the rapid development of student's independent learning.

**Benefits Gained by using ICT in Instructing Vocational Subjects and in Employments:**

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Findings revealed that the employment rate among VTC graduates was not linear as indicated in Table 2 below.

**Table 2: VTC Graduates Employment Status 2010-2016**

| Year                           | 2010    | 2011       | 2012       | 2013       | 2014       | 2015      | 2016       |
|--------------------------------|---------|------------|------------|------------|------------|-----------|------------|
| <b>Graduates</b>               | 452     | 679        | 1020       | 960        | 870        | 1245      | 1289       |
| <b>Employed (Number and %)</b> | 65(15%) | 169(24.5%) | 211(20.1%) | 364(37.9%) | 432(48.6%) | 132(10.6) | 248(19.2%) |

Source: Tanzania Employment Industry Forum, 2017.

Findings indicate that for the years 2010 and 2011, employment rates increased from 15% to 24.5% and that indicate the increase by 9.5%. The rate of employment decreased in the year 2013 but rose up to 37.9% and 48.6% in the year 2013 and 2014 respectively. This was explained to be due the establishment of 5 big manufacturing industries in Dar es Salaam and Coast regions which are within the vicinities of studied VTCs. The drop of employment rates among VTC graduates in the years 2015 (which was 10.6%) and in the year 2016 (which was 19.2%) is explained to be due to employment market freeze as well as the fall of production in industries. Ten respondents (8.3%) explained than employers were not happy with the poor skill performance of some VTC graduates and that they have been opting to employ foreigners.

## CONCLUSION AND RECOMMENDATIONS:

It is concluded that the adoption of ICT in Instruction/learning in VET Institutions enhanced instructional delivery with very little job employment opportunities among graduates and this is gap for further study. It is recommended that ICT budget in VET institutions to continue increasing yearly, effective provision of training of instructors/students, improvements of ICT environments in VET institutions and similar study to be done in other institutions in different Tanzania VET zones.

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