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The ICT implementation in the TVET teaching and learning environment during the COVID-19 pandemic

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ABSTRACT

The objective of this paper is to discuss the information and communication technology (ICT) implementation, an initiative of teaching and learning for Technical and Vocational Education and Training (TVET) lecturers and students during the COVID-19 pandemic era due to the lack of physical and practical learning activities such as handling tools, safety measure, execute machine in an emergency, conduct the material as per manual stated, last but not least functional and operational check and assessment conduct. This study employed a qualitative approach (i.e., document analysis). Data was collected from secondary sources by reviewing TVET reports, webpage, organizational structures, and news bulletins, which are observed and analyzed. The results indicated that most TVET institutions were struggling to deliver and assess practical skills training. Instead of focusing on the practical assessment method, most TVET institutions are remoting to theoretical coursework, and re-structuring the program with outcome-based education as one of the alternative solutions. The results also revealed the different approaches used by TVET institutions by relating them to several case studies. By understanding their aims and intentions, the COVID-19 pandemic indirectly contributes to the development of ICT in TVET, and therefore the technologies of teaching and learning are not left behind.

Keywords:
Covid-19, Education, Ethics, Technology, Teaching and Learning

1. Introduction

The scope of study and disciplines of Information and Communication Technology (ICT) has their meaning to the certain field atmosphere. Education is one of many parts of a wide broad ICT practicing counter. Some of the education has separated the disciplines of the field by acknowledging the application, needs, and study nature. This phenomenon must be understood by a scholar to put the right personnel so the fundamental of study may not jeopardize by difficulty and misleading at the end of the objective or outcome.

By factorizing active and passive learning; we can emphasize the main issue behind the requirements that must be fulfilled with the right tools. The tools of ICT have several lines and technic to make learning efficient and effective. Diagnose what is the right method of teaching materials, the medium of receiving, the lacking tools and limitation behavior, and the elements surrounding that may help and assist its nature. Who are the personnel involved; by categorizing an individual or

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institution, advantages and disadvantageous, pros and cons the scopes must be considered precisely. The answer will lead to a certain either common problem or specific critical ethical situation reflection. In a discussion of upbringing in all the matters listed, we will indicate the development of ICT shall be applied and practiced by the relevant party in TVET teaching and learning may conduct and deliver effectively.

The tradition of teaching has evolved over more than a millennium may record. There is no specific date that can claim the teaching and learning started unless revealed in holy worship materials as the authentic sources have had. Off course, the conventional method may not varnish and verdict claim, that communication is the only tool of effective teaching and learning process. The question is whether the system is fit for the society and community to absorb and adapt. Until technology brought human civilization in the 19th and 20th centuries, when the information was introduced called television and human get the information in Cathode Ray Tube (CRT) analog format so-called digitalize electronic androids nowadays. The transmission provides vision and is audible, helping the education demonstrate the method efficiently. People who accommodate the device could watch and listen to received messages and yet practice successfully the program and content. Some limitations must be considered during this period. The technology is only applicable in urban areas; where the technology can reach society.

Passive education has lack practicing tools. Theoretical delivery of teaching materials or syllabus content won't require as much as a vocational program. The teacher just needs to share and elaborate on the topic and discussion by sharing all the subject terminologies, theory, method, and final thoughts of the conclusion. The assessment may carry out by writing an essay as per teaching materials shared and conducted in the visual format. The evaluation can be directly assessed with the minimal procedure.

The required learning must be delivered using theoretical and practical methods. Some of the exercises need the student to demonstrate and work on the tool in front of the instructor. This must be life or in situ practice. ICT or virtual teaching faces a dead end, the moment the practical is being executed. By identifying the main issue in both disciplines of active and passive learning, we can conclude some measures must be considered before we can set up the scale of teaching. Technical and Vocational Education and Training (TVET) has a big scope of delivery lessons considered. It is not only a theoretical base, but the most important to convey and demonstrate the right way or proper way in handling tools, safety measures, executing machine in an emergency, conducting the material as per manual stated, last but not least functional and operational check and assessment conduct. Thus, the objective of the study is to discuss the information and communication technology (ICT) implementation, an initiative of teaching and learning for Technical and Vocational Education and Training (TVET) lecturers and students during the COVID-19 pandemic era.

2. Methodology

This study employed document analysis as a qualitative research method for the case study of the implementation of ICT in the TVET environment focusing on teaching and learning during the pandemic. Data were collected from secondary sources (through documentation) by reviewing the TVET reports and webpage, organizational structure, and news bulletins. Several aspects of the TVET environment are been analyzed on non-numerical data and pre-existing documents to understand the concepts, opinions, or experiences. Using pre-existing and analyzing documents may give more advantages and benefits to the researchers because of the stability of the data. This method is to gather in-depth insights into the problem and generate new ideas for the research.

The non-numerical data were analyzed qualitatively using thematic analysis by the Malaysian Education Ministry in the TVET development program during a pandemic. Generally, the data has shown the entire TVET environment in vocational schools and Higher Education institutions have offered the TVET program. During a pandemic session, some of the students were unable to complete the practical session because of Movement Control Order (MCO). Data record segmentation has been divided into two majors issue society and community that is internally and externally. The quantity is random picks up by examining the urban area and easy access to semi-urban areas or compounds. The results may represent some established communities but strictly redundant results in other societies such as rural places.

2.1 Case Study

Since the Malaysian Government announced the first Move Control Order (MCO 1.0) on March 16, 2020, all school and higher education institutions were ordered to close to prevent the spread of epidemics. This global COVID-19 outbreak discovers various ideas on promoting learning continuity from a different perspective. Unfortunately, due to global pandemic issues, technical and vocational education become one of the institutions for dealing with work-based learning. According to a survey of over 1300 respondents from 126 countries done by ILO-UNESCO- World Bank Online Survey in April and May 2020 shows that most of the respondents represent TVET providers. It is reported that 98% of TVET providers reported being disrupted by pandemic issues and over half of them are postponing the exam. Fig.1 shows the training provided during the Covid-19 pandemic.

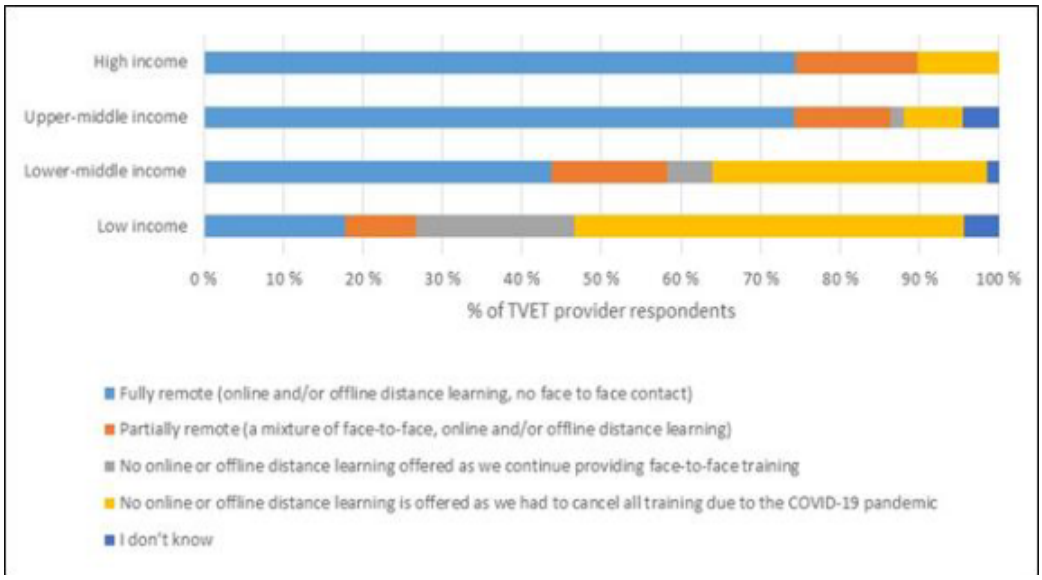

Fig. 1. Training provided during the Covid-19 pandemic (Source: ILO-UNESCO-World Bank Online Survey, 2020)

3. Results and Discussion

ICT in TVET

Due to Covid-19, ICT must be implemented in the education transition learning process [5]. There is no such way to avoid or any alternative to prolong education to be delivered effectually. The only issue is how many societies can afford the technology or materials needed to be equipped personally.

This is the dilemma for instructors or teachers in vocational educational practice. Some teaching methods can consider delivering but on the other hand considering operating machines must have actual guidance or live personal assistance during the conduct of the machine and tools. This is to avoid serious injury or fatal death to the operator handling the tools. ICT has limitations for live practical or hands-on but the demonstration can be considered.

Most TVET institutes were struggling to deliver and assess practical skills training. Instead of focusing on practical assessment methods, most TVET institutions are remote to theoretical coursework. Therefore, the integration of ICT in the TVET learning and teaching process is one of the transitions to remote learning modalities. During the pandemic, the use of ICT has increased for the management and delivery of TVET in both developed and developing nations. The importance of ICT for growth and global competitiveness is documented by Global e-Schools and Communities Initiatives (GeSCI) in 2011. UNESCO and GeSCI claimed that they are very committed to the usage of ICT to deliver TVET in both formal and non-formal settings to support all countries to achieve national TVET objectives [2].

The issues of using ICT as a tool in TVET are the effectiveness and quality of education provided. It is mentioned in 2013 by UNESCO that 'a quality TVET program plays an essential role in promoting a country's economic growth and contributing to poverty reduction as well as ensuring the social and economic inclusion of marginalized communities.' [2].

The Impact of ICT on TVET Education during Pandemic

The impact of ICT on TVET could be divided into two categories to be examined; the perspective of learning institutions, instructors or teachers, and students as consumers. We may presume many issues rose from all parties involved without put aside little problem to be accounted to. The matter to solve every matter and major role is the Ministry of Education and policy TVET they have. Based on research done by [6] stated that ICT has positively impacted students' academic performance in achieving a competent TVET education in terms of quality and productivity. This is because ICT allows easy exchange of information with peers and ICT facilitates smooth interaction with the lecturers.

Ministry of Education - Vocational Field

Malaysia has been known as an industrial country since Tun Mahathir Mohamad as 4th Prime Minister of Malaysia launched the new era and evolution of Malaysia's Economic Plan toward an Industrial Nation. The impact of the 1st National Car Proton was introduced and many high technology industries change directions to Industry 2.0 since the end 0f the 1980s. Yet the country set the technology evolution vision for Japan making every ministry must transform aggressively to achieve Wawasan 2020.

Recognize as an agricultural country and white-collar field, the phenomena of industry are a drastic change. Recorded that Mara Institute of Technology known as RAIDA being introduced with skill and hands-on toward engineering technology disciplines, still the country needs the new youngster to cater to Industry 3,000,000 approx. annually. This transformation in High-Tech Industry has boosted the University of Technology Malaysia to play a role to assist the nation to achieve a Development country in Wawasan 2020.

The impact of covid-19, an era of the pandemic has changed the direction of new ICT implementation toward vocational education [3]. Since technology requires hands-on skills, the government must identify the right tools to apply to the precise discipline of study and human aptitude. The simulation program is a new thing and demands millions of dollars of investment.

Smart simulator technology for certain engineering disciplines can be a solution, but every technology must pay the price and consider the training involves and how the environment consumes. The government especially the Ministry of Education must act fast; the victim will be a new generation to master the skill and comply with the latest industry needs. Re-structure the program with outcome-based education is the alternative solution.

Learning Institution

Identification of high-tech industries such as mechanical and electronic disciplines has conquered most new technology. Computer and android are common tools nowadays. Most people do not require formal education to master technology. The computer phobia has no longer occupied a person to achieve the knowledge and paranoia has left since Y2K.

In vocational learning institutions, the fundamental of technology must be acknowledged what kind of technology became the mainstream of the study. Engineering evolution in China has left behind Korea which leads 20 years ahead before China discovers the new world economic order.

During the pandemic, TVET institutions have to develop a digital curriculum data-based including digital monitoring and digital assessment method. The TVET providers are suggested to shift the implementation of the digital curriculum to adapt to new norms. The preparation of infrastructures such as internet connectivity, devices or media, learning platforms, and also competent trainers and teachers should depend on the capacity of the institution (UNESCO- UNEVOC International Centre, 2020). The institution has to revise the management operation to upgrade the new medium of teaching and learning techniques. It is a big challenge for the institution to convert from an old teaching method to a more innovative and technological method [4].

Instructors/ Teachers

Vocational is engineering technology disciplines where 75% is hands-on and 25% with theory. The trainer must show and demonstrate every technical aspect to the trainee or student to avoid unwanted accidents and incidents occurring. Technical and skills are two disciplines with high respectable required. To master the techniques and skills, experiences with respected periods must be achieved. There is no shortcut or fast track to having this expertise.

The question into the ICT issue is, what is the right tool so the student may absorb the proper training and safety awareness of technology applied? And what is the best method for a trainer to achieve an ICT program that may tribute certain optimum right tools and assignments? This is passive learning even though the training provides safety measures issues. Warranty no bad incident or accident can occur and danger to trainee life. The main concern for teachers is not being prepared for the usage of ICT in teaching. To incorporate and adapt to technology, additional training is required for improved educational outcomes. It is very important to use appropriate technology in every single context to fully integrated it into curriculum design, pedagogy, learning objective, and assessment. It is the instructor's responsibility to prepare the necessary teaching method with adaption in a different situation because ICT solution does not come in ready-make solution.

Students and Society

Dilemma to the student who requires to fulfill the needs program of vocational, understand the nature which new experiences without a clue must obtain the ICT knowledge and implement is the challenge. The use of ICT in learning methods can improve the quality of education via project-based

learning which helps to develop critical thinking, problem-solving, and creativity in students. It will support lifelong learning.

Gaining education through an internet base and virtual meetings with instructors/trainers is a new phenomenon in world history. How the student shall do practically by watching the trainer demonstrate the process of the project? Some subjects and topics must be done in the workshop for the right tools and right jobs. How the virtual may simulate as the same as actual work carried out? Active performance may not the same just simple observation.

Society must put at risk the quality of the new generation which may not the same as the previous expert person they can rely on. The impact on the pandemic generation may slow the process of skillful personnel. The ICT for TVET may not achieve productivity-wise but that is the best way to solve the generation left behind. In addition of ICT skills in TVET can give both quality and high perception in person as there is a constantly changing job market today. It will be forming a toolkit for long-term employability and success in the workplace. Finally, it also will create a great potential for job creation and economic growth to emerge a new TVET revolution with ICT skills.

The ICT Professional Ethics in TVET Education

ICT now become one of the global aspects in many sectors, especially in the education sector. It brings ethical issues to the education sector on how to handle real-life situations from an ethical perspective. As per define by a researcher, ethics is to determine the quality of human doing [1]. Therefore, many aspects should be considered in ICT ethics as ICT becomes the main role in education during a pandemic.

One of the important issues in ICT ethics is copyright law and plagiarism [8]. Some students may copy and paste without realizing the copyright implications. Understanding copyright and related laws will help ensure students follow the rules in using and sharing content. It is important to use citations to respect copyright laws and eschew plagiarism. The Copyright (Amendment) Act 1997, which amended the Copyright Act 1987, came into force on the 1st of April 1999, to make unauthorized transmission of copyright works over the Internet an infringement of copyright [9]. It is also an infringement of copyright to circumvent any effective technological measures aimed at restricting access to copyright works. These provisions are aimed at ensuring adequate protection of intellectual property rights for companies involved in content creation in the ICT and multimedia environment.

While implementation of ICT in TVET required significant costs in manpower as well as technical equipment. Often happened a cutting in cost and outdated technology. Failure to secure funding to maintain the license of certain teaching software will lead to pirate issues. Therefore, it becomes the major ICT ethic and the limiting factor for the growth of digital TVET.

Instructors and students have to take care of technology equipment. They have to be more careful about what they download, click, and share. While exploring the internet, there are so many websites that contain inaccurate or irrelevant information. Therefore, students need to distinguish the most important and trusted content that can be assessed for the learning process. This will improve the Improved skill of thinking and working independently. The application of ICT as new teaching and learning techniques can strongly improve students' interest, skills, and also performance [7,10].

Both instructors and students should help in preventing cyberbullying crime. The anonymity of the internet may lead to harm and damage to other people feeling and reputations. Instructors' attitudes and mindsets may influence the student toward the effectiveness of ICT in education. Students must expose to cyberbullying crime awareness and the implication of the crime on the damage it can be. Give examples of cyberbullying and encourage students to report any

cyberbullying incident to teachers, counselors, administrators, or their parents. Students should learn how to use technology responsibly.

4. Conclusion

The ICT discipline has allowed people to evaluate every aspect of ICT may offer and may not be offered. Yes, since Y2K technology has evolved drastically in all areas of study and lifestyle. People who did not update with the latest technologies consider left behind and cuno-type people. ICT has its impact and ethics on certain communities and societies. It does support the effectiveness and efficiency in a certain area, but not the area that may implement the tools. Even though pandemic situations require every person to have a smartphone to register for entering premises and compounds. This is to manage movement and control the spreading of the disease to be wild and uncontrolled.

From the perspective of education, ICT has assisted a lot in the COVID-19 generation. It helps the community to minimize face-to-face communication and less worry to parents for children being exposed. Besides the young generation start to know what is a computer. Laptop, support tablet, etc. to improve pursuing effective education. More or less, this technology is only friendly to people who may afford the tools and equipment. Some people must share the android with many siblings. Malaysia considers the luckiest country that recorded less poverty. Still manageable and assist able those who lack computer and electronic devices.

Since the pandemic, the government has identified the need to improve the infrastructure of ICTs. The root cause and effect for every issue and problem are identified and upgraded to the need and demand for children. In TVET education, the Ministry of Education has encouraged vocational experts to propose a new initiative so the technology of teaching and learning may not leave behind. The nation needs professionals in engineering technology and full skills personnel to develop Malaysia as high technology Industry 4.0.

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