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Digital Competencies for TVET Educators: A Framework for Professional Development

Kompetensi Digital untuk Pendidik TVET: Kerangka untuk Pembangunan Profesional

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ABSRACT

Digitization in the field of Technical and Vocational Education and Training (TVET) has now become an integral part of our world today. This means that instructors in this field should be well equipped with digital skills if they are to offer their learners an effective instruction within a digital environment. This article puts forward a framework for nurturing digital competences among TVET instructors and shares findings of an empirical study. The framework is made up of five main components for digital teaching. In order to achieve this objective, a research was done where a survey was conducted on various MTUN universities. The results showed that majority did not have enough knowledge in using technology to teach effectively. The study also brought out some challenges faced when trying to implement such training programs on how to raise these competencies within TVET systems which were lack of resources, limited time and reluctance among staff members themselves. This research can be of great help to TVET institutions and governments who want to improve the digital capabilities of their instructors in the TVET sector. These findings may be used as a guide in training programs development for instructors teaching TVET subjects. Eventually it will contribute towards understanding how important digital competence is within TVET while at the same time underlining its role as being an essential skill needed to meet the demands of contemporary society characterized by increasing use of technology in all spheres of life.

Keywords: Digital competencies; Technical and Vocational Education and Training (TVET); Educator professional development; Digital literacy; TVET instructors

ABSTRAK

Pendigitalan dalam bidang Pendidikan dan Latihan Teknikal dan Vokasional (TVET) kini telah menjadi sebahagian daripada dunia kita hari ini. Ini bermakna pengajar dalam bidang ini harus dilengkapi dengan kemahiran digital jika mereka ingin memberikan arahan secara berkesan kepada pelajar mereka dalam persekitaran digital. Artikel ini mengemukakan kerangka untuk memupuk kecekapan digital dalam kalangan pengajar TVET dan berkongsi penemuan kajian empirikal yang dijalankan. Kerangka ini terdiri daripada lima komponen untuk pengajaran digital. Bagi mencapai objektif ini, satu kajian telah dilakukan di mana satu tinjauan telah dijalankan ke atas pelbagai universiti MTUN. Hasil kajian menunjukkan ramai yang tidak mempunyai pengetahuan yang cukup dalam menggunakan teknologi untuk mengajar dengan berkesan. Kajian ini juga mengemukan beberapa cabaran yang dihadapi oleh pengajar apabila mereka cuba melaksanakan program latihan berkenaan bagi meningkatkan kecekapan ini dalam sistem TVET yang kekurangan sumber, masa yang terhad dan keengganan di kalangan kakitangan sendiri. Penyelidikan ini boleh membantu institusi TVET dan kerajaan yang ingin meningkatkan keupayaan digital pengajar mereka dalam sektor TVET. Dapatan ini boleh digunakan sebagai panduan dalam pembangunan program latihan untuk pengajar yang mengajar mata pelajaran TVET. Akhirnya ia akan menyumbang ke arah memahami betapa pentingnya kecekapan digital dalam TVET dan pada masa yang sama menggariskan peranannya sebagai kemahiran penting yang diperlukan untuk memenuhi permintaan masyarakat kontemporari yang dicirikan oleh peningkatan penggunaan teknologi dalam semua bidang kehidupan.

Kata kunci: Kecekapan digital; Pendidikan dan Latihan Teknikal dan Vokasional (TVET); pembangunan profesional pendidik; Celik digital; Pengajar TVET

INTRODUCTION

TVET programs are created to give people the knowledge, skills and competencies needed for success in the workplace. They provide training in numerous fields such as health care, engineering, hospitality industry or agriculture among others. However, due to rapid digital transformation taking place within different sectors of the economy, it is important that these courses also adapt so as not leave their graduates behind when looking for jobs that suit this era (Ali, Triyono & Koehler, 2020). Hence, it is imperative to see that TVET instructors possess the requisite skills for delivering lessons in a digital format. It is apparent that instructors should not only be capable of integrating information and communication technology (ICT) during the courses they offer but also be competent at using different devices to share learning materials and methods with their students (Kirkscey, 2012). The need for TVET instructors to have good digital skills go without saying. These interactive learning environments offer students a much higher level of motivation, and student participation also sees an increase when instructors are well versed with digital technology. This expertise also empowers instructors to include different types of digital tools and resources in their teaching, thus, paving the way for them to design more interesting and adaptive learning opportunities for their students in the digital age. However, there are a number of educators who still do not have such qualification, hence enforce the misalignment between what is being taught in institutions and what the industry requires (Abdullah, Ismail, & Abdul Aziz, 2024). Quite a few lecturers are not competent enough in the process of integration and adaptation to full digital delivery modes.

TVET instructors may be deficient in digital technology knowledge and practical skills, some of the technologies they may be unfamiliar with while implementing functional tools that will help them teach effectively are likely to be the obstacles. Not only this, but they might also be out of touch with the latest trends in digital economy or best practices of the industry, which, perhaps, they consequently stand in the way of students' full readiness for the future roles in the workplace. Nevertheless, there are several instructors who are very conservative and some are even unwilling to make changes. The first issue instructors face is with the fear of getting used to the new digital tools, due to the fact that they are aware of the upcoming challenges in the learning of such devices (Holler, Brändle, & Zinn, 2023). One of the factors which are also responsible for the lack of technology skills among TVET instructors is the absence of proper digital technologies into these programs, which is well illustrated by the example given in the (Hassan et al., 2021). Although many colleges are already integrating digital tools in their curricula, some are still hanging on to traditional methods, which do not give instructors enough openings to get the necessary digital skills. Whenever there is a lack of resources, this task becomes almost impossible for institutions to achieve. According to some of the reasons advanced, the non-availability of funds to purchase devices or software, the lack of support technical teams to guide instructors throughout the process (Dinc, 2019), as well as the insufficient infrastructure such as the presence of only low internet speed and old hardware pieces that may not be able to offer instructions delivery system of a high quality.

Moreover, there is a deficiency in terms of the provision of training and professional development opportunities for TVET instructors. Although digital technologies and learning platforms have been included in TVET programs, many instructors have not been given the training or support that is necessary to use these tools properly (Nkambule & Sithulisiwe, 2022). Professional development is an ongoing process of training and education aimed at helping instructors update their teaching methods, digital technologies, and industry trends. Without the

needed guidance and professional development, instructors may be challenged in imparting of information through technology, which in turn, affects the quality of education. Instructors who lack the ability to integrate digital technology in their teaching will find it difficult to train their students in digital literacy skills. The absence of this kind of training can also take its toll on instructors' trust in technology, leaving them unwilling to adopt technology in their workplaces, and thus further increasing the digital skills gap among TVET faculty. Limited interaction and communication between the industry and TVET institutions are other contributing factors to the lack of digital competence amongst instructors. The majority of digital innovations are born within industries, and as such, the learning institutions must act in concert with their partners in the industry so that the course contents are revised in a way that the digital economy requires. The skills that the technical training schools teach must fit into the employers' needs; otherwise, there will be a gap between the education and industry needs (Ali, Triyono & Koehler, 2020).

Furthermore, several TVET facilities are suffering from lack of access to digital technology and training programs for instructors, which worsens the digital divide among instructors (Hassan et al., 2021). In some developing countries and remote areas, computer or internet connectivity might not be available in TVET institutions, thus e-learning becomes unfeasible due to the absence of digital resources for staff. Also, the instructors could even use different types of software or technology tools within their various training institutions, which is due to the fact that there is no certain standard in integrating digital technology or cyber facilities in teaching of students (Ramadan, Chen & Hudson, 2018). This in turn, maybe a real problem, because it can lead to instructors' stress as they try to keep up with the new technology. With effective training programs made available, TVET institutions have a chance to come up with the necessary skills that will encourage the use of digital technology in class by instructors. This calls for the harmonization of digital technology integration in TVET institutions' teaching and training methods.

METHODOLOGY

A study that utilized a mixed-method research design aimed at finding digital competence among the TVET instructors in the Malaysian MTUN universities has been conducted. The study population is made up of TVET instructors from four Malaysia Technical University Network (MTUN) institutions: Universiti Teknikal Malaysia Melaka (UTeM), Universiti Malaysia Pahang (UMP), Universiti Malaysia Perlis (UniMAP), and Universiti Tun Hussein Onn Malaysia (UTHM). A technique of stratified random sampling based on their location and discipline areas such as engineering, hospitality, or business was applied to choose the sample. A total of 120 instructors were picked out with 30 respondents from each university. In every university, the instructors were further divided into their discipline areas. This was inclusive of 10 instructors from engineering, 10 from hospitality, and 10 from business.

A structured questionnaire was developed. This questionnaire was to collect quantitative data on digital competency assessment tools used by instructors in TVET, their access to digital technologies, and their training needs. The questionnaire items were developed by combining items from relevant literature and other instruments that have already been validated with adjustments to fit the MTUN context. Instructors who were the targets were given an email with the questionnaire hyperlink which was given using Google Forms. The gathered data were analyzed using the descriptive statistics that are used in terms of mean, frequency, and percentage. The data were also collected through semi-structured interviews with selected TVET instructors.

In doing so, the goal was to get a good understanding of their experience, the issues they were facing, and their possible solutions for improving the digital skills of instructors. Interviews were either face-to-face or video conferences, which is based on participant comfort and time. The interview sample included 6 people, with the choice of the participants who agreed to participate in the survey, following the sampling criteria of the questionnaire. Thematic analysis was used for qualitative data analysis, coding transcripts into categories and interpreting them according to different themes related to the research questions. Patterns were identified to understand the level of technology skills among the lecturers from different fields, the root causes of the digital literacy gaps that exist within the vocational education training sector, and the effectiveness of current capacity-building programs on ICT integration into the teaching-learning process in higher institutions offering the TVET courses.

DATA ANALYSIS AND FINDINGS

QUANTITATIVE DATA ANALYSIS

Descriptive statistics were used in analyzing the quantitative data that was collected using a structured questionnaire. It contained questions pertaining to five constructs: technical skills of digital technology, pedagogical skills of using digital technology to teach and learn, attitude towards integration of digital technologies into TVET teaching-learning process, accessibility to ICT resources and training opportunities for integrating digital technologies within TVET systems. According to the results, it is evident that respondents had average levels when it comes to their technical skills in digital technology (M=3.52, SD=0.67) as well pedagogical skills in using digital technology for teaching and learning (M=3.44, SD=0.68). However, mean scores for attitude towards digital technology integration in TVET were even lower (M=3.38, SD=0.68) while mean ratings on access to digital technology resources stood at 3.29 (SD=0.74). This implies need for improvement in all these areas since none met or surpassed expectation levels. Nevertheless, the most outstanding issue highlighted by these findings revolved around training opportunities meant to equip instructors within the Technical Vocational Education Training sector with skills on how best they can use ICTs effectively during teaching and learning process (M=2.98, SD=0.83). The gap observed here calls for urgent intervention measures considering that such trainings are key towards enhancing quality education delivery among other benefits attributed thereof.

TABLE 1. Digital Competencies of TVET Instructors in MTUN Universities in Malaysia

Digital Competency	**Mean Score**
Technical skills in digital technology	3.52
Pedagogical skills in using digital technology for teaching and learning	3.44
Attitude towards digital technology integration in TVET education	3.38
Access to digital technology resources	3.29
Training opportunities for digital technology integration in TVET education	2.98

Additionally, it was found that the average scores of the five constructs differed significantly among various fields of study. Engineering and technology respondents noted higher mean ratings in terms of technical skills (M = 3.74, SD = 0.55) and pedagogical skills (M = 3.62, SD = 0.59) than those from business and hospitality industries. Similarly, these participants also indicated more positive access levels to digital technology resources (M = 3.53, SD = 0.68) as well

as attitudes towards its integration within TVET for engineering and technology (M = 3.52, SD = 0.67) compared with their counterparts in business plus hotel management faculties. Nevertheless, all subject areas recorded relatively low mean scores pertaining training opportunities related to digital technology integration in TVET. Obviously, this means that the Malaysian Vocational Education Training (TVET) instructors have a fair amount of knowledge and skill in using digital technologies. Nevertheless, the results also point out the need to work on some areas such as the usage of digital tools and resources and their availability. Besides, this is the opportunity for them to improve of their knowledge and skills in handling the virtual technologies. Filling these gaps are very crucial for enhancing digital competencies among TVET instructors in every area of disciplines.

QUALITATIVE DATA ANALYSIS

Our team employed the thematic analysis technique to examine qualitative data obtained from the semi-structured interviews conducted with TVET instructors. Through the analysis, four main themes were discovered to be in line with the research questions: (1) Problems of gaining digital skills, (2) The use of digital technology in teaching and learning, (3) Training necessities for enhancing digital competences, and (4) Measures for improving digital proficiencies.

In the first theme, it was unveiled that among TVET lecturers, scarcity in digital equipment accessibility, few training chances, and resistance against change remained the major obstacles towards acquiring digital skills. The second theme demonstrated that through providing interactive and captivating learning experiences, digital technology could improve teaching as well as learning processes. This is because such methods enhance students' motivation and participation while fostering collaboration and communication. According to the third theme, continuous training programmes need to be put in place if we are to see any meaningful results in terms of enhancing specific needs and interests among instructors at technical colleges or institutions offering vocational education training. Additionally, the fourth theme suggested various ways through which these can be achieved for example creating culture of e-learning where everyone feels included regardless their status quo ante concerning ICT related matters, offering incentives and rewards for those who come up with new digital ideas or solutions within their respective areas of operation, establishing partnerships with industry players and other stakeholders in education sector so that they may work together towards achieving common goals.

TABLE 2. Themes and quotes for qualitative findings

Theme	Participant 1	Participant 2	Participant 3
Problems of gaining digital skills	"I found one of the major problems of acquiring digital competencies was that we did not have access to current technology. At our college, resources were few. It was hard for us to keep in touch with new tools and software all times"	"There were very few chances for training which acted as a big barrier. I did not have anyone to show me how best I could use digital technology in teaching except for myself. More organized programs would be better"	"Many educators were against change. This was another challenge among instructors regarding technology in schools. Some thought the traditional methods were more efficient than using new devices because they were not familiar with them while others feared what they could not understand."
The use of digital technology in teaching and learning	"My class has completely changed due to this. Many students engage more now	"It promotes teamwork since students can collaborate irrespective of	"I have never had so many resources at my disposal as I do now when using digital

	than before when I used normal books only. Their participation levels have also gone up because of various teaching applications and interactive learning sites which we utilize together with them"	their physical locations. The most significant advantage I see in e-learning is that it creates room for group work among pupils through projects and online discussion boards where each member contributes based on his/her understanding thus fostering a sense of togetherness"	tools for instruction purpose. Teaching resources are infinite. Before, it was difficult for me to find appropriate videos or simulations that would help engage and enlighten them more about what we were learning in class but currently there is a wide range of these materials which can be easily accessed "
Training necessities for enhancing digital competences	"Continuous and relevant training programs are crucial. We need training that focuses on the specific needs of TVET educators, such as industry-specific software and applications. It would be great to have workshops and courses tailored to our disciplines."	"Hands-on training is essential. We need opportunities to practice using digital tools and receive feedback. It would be helpful to have workshops where we can work through real-life teaching scenarios and learn from experienced educators."	"Training should cover not only the technical aspects but also pedagogical strategies for effective integration. We need guidance on how to design engaging online activities, facilitate discussions, and assess students' digital work."
Measures for improving digital proficiencies	"An effective way to improve digital proficiencies is by creating a technology support center that is separate from any other department within the organization. This can be done through this centre providing continuous help, fixing problems as they arise and informing people about new tools on a regular basis."	"We could greatly boost our digital skills by starting up mentoring schemes. Those who have more experience in this field should be able to mentor those who do not know as much about it. Thus sharing skills and tactics used when incorporating technology into teaching methods becomes easier."	"Students and instructors need to give feedback regularly so as to know if digital tools have been beneficial in class. Furthermore, making digital competence one of the key areas assessed during appraisals might encourage faculty members keep enhancing their technological skills over time".

Overall, the findings suggest that the level of digital competencies among TVET educators in MTUN universities in Malaysia is moderate but varies across different disciplines. Access to and use of digital technology for teaching and learning is limited, and the level of training provided to educators is inadequate. The study also identified several challenges, benefits, training needs, and strategies for improving digital competencies among TVET educators in the sector. These findings have implications for policy and practice in the TVET sector in Malaysia and provide directions for future research.

DISCUSSIONS

The aim of this study was to investigate the proficiency of TVET lecturers in using digital technology at Malaysian universities with particular reference to MTUN and to devise a professional development plan based on these results. The research discovered that although most instructors of vocational subjects possess an intermediate level knowledge in this area there are certain departments where their skills may be considerably different. It also sought to establish difficulties encountered, advantages gained, training needs, as well as ways of enhancing competency among such educators. According to the findings of this investigation a framework

for developing professional competencies among TVET instructors was suggested. To develop a comprehensive professional development plan, the study employed a triangulation method to integrate both quantitative and qualitative findings, ensuring a robust and empirically grounded framework. Here's how the process was carried out:

TABLE 3. Triangulation method to integrate both quantitative and qualitative findings for framework

Elements	Quantitative Data	Qualitative Data	Triangulation
Assessment of Digital Competencies	• Structured questionnaires were used to collect data on instructors' technical and pedagogical skills, attitudes towards digital technology integration, and access to digital resources and training opportunities. • Descriptive statistics provided full overview, highlighting areas that need improvement	• Semi-structured interviews provided in-depth insights into the instructors' experiences, revealing specific challenges such as limited access to current technology and training opportunities, and resistance to change among staff.	• The quantitative data identified gaps in competencies and resources • qualitative data provided context and personal experiences explaining these gaps. • This integration highlighted the need for a comprehensive assessment tool that evaluates both the technical and pedagogical competencies of instructors.
Training and Development Programs	• Survey responses indicated a general lack of sufficient training opportunities, with mean scores reflecting inadequate access to professional development programs.	• Interviews detailed specific training needs, such as the necessity for hands-on, industry-specific training programs and continuous professional development to keep up with technology.	• Combining these findings showed the importance of creating specific training programs that address the specific needs of different disciplines. • The framework includes the development of diverse and continuous training programs that are practical and relevant to each instructor's field.
Evaluation and Feedback Mechanisms	• The quantitative data showed that while there is some level of digital competency, the attitudes towards integration were notably low, suggesting a need for ongoing evaluation and feedback to foster improvement.	• Qualitative data revealed that instructors valued feedback but often lacked structured opportunities for peer or supervisor evaluations and self-assessment.	• The combined data highlighted the need for regular evaluation and feedback mechanisms to continuously assess and improve digital competencies. • The framework incorporates self-assessment, peer reviews, and supervisor evaluations to ensure ongoing development and adjustment to the instructors' needs.
Support Systems	• Survey results indicated limited access to digital resources and support, which was a significant barrier to effective digital integration.	• Interviews revealed a need for better technical support, access to digital learning materials, and a community of practice for sharing experiences and solutions.	• By integrating these findings, it became clear that support systems are essential for the successful implementation of digital technologies in teaching. • The framework includes the establishment of

	technical support centers, provision of digital learning resources, and the creation of professional learning communities to foster collaboration and continuous improvement.

This suggested framework comprises four key elements such as assessment of digital competencies, training and development programs, support systems evaluation and feedback mechanisms which should be incorporated into every stage of implementation so that effectiveness can be continuously monitored. Each component is described in details as shown below:

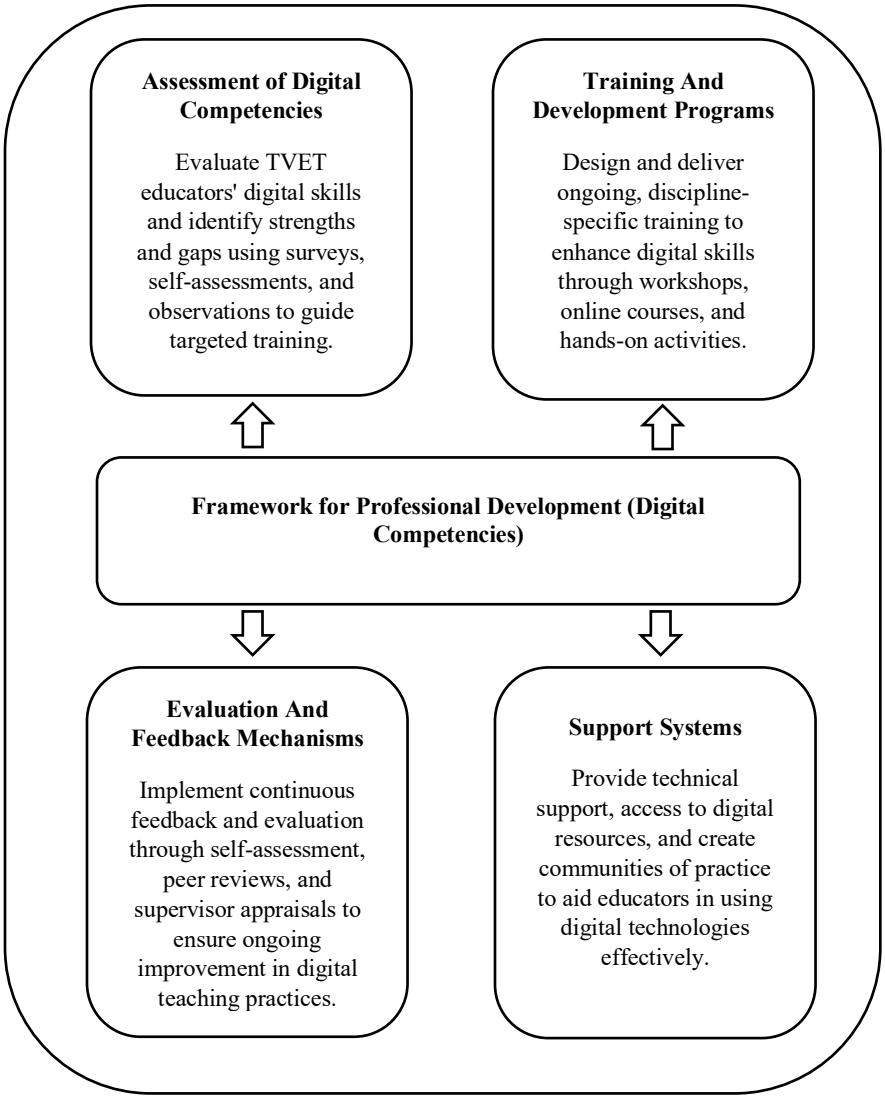

FIGURE 1. Framework for Professional Development (Digital Competencies)

Evaluating the knowledge, skills, and attitudes of TVET educators in terms of using digital technologies for teaching and learning is a very important task when it comes to digital competence assessment. This provides insight into their level of proficiency with different digital tools, ability to integrate technology into instructional practices as well as general comfort with resources available digitally. There are several methods that can be used to conduct this assessment effectively. One of the most commonly used methods is through surveys and questionnaires. These instruments are designed to collect quantitative data on educators' familiarity with various digital tools, comfort levels when using them or any other related perception about their competencies in this field. Such types of questions may include those graded on a Likert scale, multiple choice items among others coupled with open-ended prompts aimed at eliciting more comprehensive responses from the respondents concerning their skills (Bitemirova et al., 2023).

Another way would be by means of self-assessment rubrics which outline different levels of proficiency for each competency area. The instructors should be given these rubrics so that they can rate themselves based on what is contained in there thereby giving a subjective view about where they stand regarding ability. Such self-ratings may then be compared against objective ratings obtained through other means thus providing an all-rounded understanding about individual's digital competence level (Holler et al., 2023). Additionally, direct observation also proves to be quite useful during assessment processes. Educators can be observed by trained personnel while using digital technology in classroom settings. This will enable evaluators judge among other things how well a instructor can maneuver through various software packages, ways through which they incorporate them into their lesson plans besides interacting with students via technology centric activities. Observers need to make notes of their findings which should later guide them when providing supportive feedback so that strengths are upheld while weaknesses worked on (Elzahaf et al., 2021).

An opportunity for a practical assessment is provided by tasks based on performance. Instructors might be given practical tasks or scenarios where they have to apply digital tools and resources. The completion of these tasks can be used to measure how well they really understand technology and their problem-solving skills in this area. Creating digital learning materials, working with learning management systems, and making multimedia presentations are some examples of performance-based tasks (Lázaro-Cantabrana et al., 2019). In addition, educators' portfolios and artifacts could serve as proof of their computer literacy. Portfolios may contain various digital projects, lesson plans or teaching materials which instructors developed themselves. Such documents not only show what kind of work has been done but also prove the ability to use digital technologies for educational purposes (Ghomi & Redecker, 2019).

It is important to assess the level of instructors' digital competence. To begin with, it helps in identifying the strong and weak sides of educators. Knowing where they are good at and where they lack skills will enable us to create special programs aimed at improving certain areas while using those already possessed in the best possible way (Rusalam et al., 2019). The evaluation process is necessary for another reason too – tailoring professional development courses according to one's needs. If we know what subjects TVET instructors are more or less proficient in terms of computer literacy, then training programs can be designed specifically for each of these disciplines. In such a way every instructor receives training adjusted to the demands of his subject matter area (Sillat et al., 2021). Thirdly, tests can be used as a means of assessing training effectiveness. It is possible to measure the success of an educational experience by carrying out assessments before and after carrying out training activities. Before the programs take off, staff should be tested to

identify their levels of computer literacy. After these initiatives have been implemented, another round of assessment will be required to determine whether significant changes took place or not. By comparing the results obtained in these two stages, it becomes clear what progress has been made and which areas still need some work (Maderick et al., 2016).

Moreover, ongoing assessments make it possible to monitor the progress of instructors and identify new needs. New skills and knowledge may be required as technology changes. Continuous assessments make sure that instructors' digital competencies are current and relevant, also they assist in adapting training programs to meet emerging needs (Karim & Mustapha, 2022). Furthermore, assessment processes facilitate fair access and support. Fair access is promoted when differences in access to digital technology and training opportunities among instructors are identified. Institutions can then provide resources equitably so that every instructor gets equal chances of developing necessary digital competences regardless of their age or experience (Diao & Hu, 2022). In conclusion, various methods and tools need to be used during the process of assessing TVET lecturers' digital competence. The exercise is important because it helps understand what skills educators have, tailor professional development courses for them evaluate effectiveness of different training schemes keep track of improvement among staff members create conditions which will ensure equity regarding both availability and utilization supportive services provided by an organization or learning institution towards achievement success. Educators must be well versed with these competences if they are to effectively use technology for their teaching and learning activities hence the need for thorough assessments.

TRAINING AND DEVELOPMENT PROGRAMS

Training and development programs play a significant role in enhancing the digital skills of TVET educators from MTUN universities in Malaysia. These programs are meant to address the problem of inadequate training of instructors on digital technology and ensure that they can effectively integrate digital tools and applications into their teaching and learning practices. However, it is important that these training and development programs for TVET educators be need-specific. The first thing to be taken into account is that such programs should be aligned with different TVET disciplines. Educators will thus receive training on various digital tools, applications, and concepts relevant to their areas. For instance, those in engineering or technology-related fields may require knowledge in programming languages and simulation software, while their colleagues in business or hospitality may need skills related to digital marketing and online booking systems (Mohamad et al., 2009).

Delivery methods for training programs should be diverse enough to accommodate different learning styles and preferences among instructors. Some can be done face-to-face, others through online courses, webinars, or workshops, allowing each educator to select what best suits their schedule or mode of learning. Additionally, these activities must be interactive, engaging, and hands-on to make any meaningful impact. Therefore, instructors need opportunities to actively practice with new media tools during training sessions rather than just being told how things work theoretically without practical examples. This type of learning by doing helps gain more insights into various concepts and demystifies complex terminologies, thereby becoming knowledgeable about such issues in an experiential manner before going out into real-life situations related to each discipline under study (Razak et al., 2022).

In addition, training programs should not be seen as one-time events but rather continuous processes that happen over and over again. In other words, they need to take place regularly since

the world of digital technology keeps changing almost every other day. If educators are not updated with current trends, their knowledge becomes obsolete quickly, rendering them irrelevant in today's fast-paced society where everything is being automated. Technology is evolving at an astonishing speed, hence there will always be something new waiting around the corner. Training programs must be designed in such a way that new methodologies can easily be integrated as soon as they come up without necessarily having to overhaul the entire system (Ismail et al., 2016). There are different reasons why training programs are important. First, they empower instructors by giving them the necessary digital skills. These programs help instructors learn to use various digital tools and applications to improve their teaching methods and create engaging lessons for students. Secondly, these training courses build confidence and competence among instructors. They can try out new things in their practice, gaining more knowledge about what works best with different students. Thirdly, continuous education on technology fosters lifelong learning and professional growth, enabling instructors to stay updated on changes being made from time to time (Ismail et al., 2018).

Furthermore, it is necessary for training programs that enhance the practical application of instructors' digital competencies to be offered. Partnerships with industry players, project-based learning activities, or involvement in digital innovation projects are some of the ways through which educators may be provided with this kind of training opportunity. Such hands-on experiences should be conducted within authentic contexts to help strengthen their skills further and promote innovative instructional approaches in the future. Organizations need strong cultures supporting these initiatives if they want success realized at any level. Leadership backing, incentives, and rewards systems around the introduction of new ideas using internet resources within their institution walls should never be missed when talking about what it takes for an institution to create an atmosphere where every educator feels encouraged to not only adopt but also experiment with diverse teaching methodologies utilizing ICT tools (Sani et al., 2023). In conclusion, various methods and tools need to be used during the process of assessing TVET lecturers' digital competence. The exercise is important because it helps understand what skills educators have, tailor professional development courses for them, evaluate the effectiveness of different training schemes, and keep track of improvement among staff members. Educators must be well-versed in these competencies to effectively use technology for their teaching and learning activities, hence the need for thorough assessments.

SUPPORT SYSTEMS

TVET has support systems that are of great benefit in enhancing the digital competencies of educators. Resources, aid, structures are among what these systems entail to help instructors integrate digital technology effectively into their teaching and learning practices. They are meant to assist instructors overcome challenges, access educational materials, work with others in the same field, among others. Strong support systems should therefore be put in place so as to create a favorable environment for the growth of these skills among TVET instructors. One of the most essential parts of any support system is the availability of technical personnel who can offer assistance when needed. These experts help diagnose hardware/software related problems, give directions on how best certain software tools can be configured while at the same time troubleshooting any issues that may arise during usage thereof within the instructional practice context by educators either onsite IT support staff or external technicians through their service provision should ensure quick response time coupled with expert advice thus enabling instructors

not be affected much by technical hitches which would otherwise lead them into shying off from using these devices altogether (Jafar et al., 2020).

Another thing that cannot be ignored under support systems is availing learning materials meant for boosting instructor's abilities in using technology for educational purposes. These may come in the form of online tutorials, instructional videos, e-books and other relevant resources purposely created to impart knowledge as well skills required in handling digital devices by instructors hence making such materials accessible through various internet platforms like learning management systems (LMS) or specific resource centers where one can download them at his/her own convenient time thereby promoting self-paced learning among educators (Njuki, 2023). Equally important are communities of practice within support systems designed to bring together like-minded professionals who share common interests around digital pedagogy so that they can collaborate and learn from each other's experiences towards improving their skills continuously over time (Hashim et al., 2019).

Recognition and encouragement of innovations in the digital space are important aspects of the support systems. Institutions are able to acknowledge educators through prizes which can be given or other forms of recognition occasions that are geared towards showing how they have applied their tools using creative methods in teaching practices. In addition, instructors who have effectively integrated digital technology in their instructional strategies should be given financial rewards like grants and allowances. Promotion opportunities can be offered to those who have demonstrated consistent excellence in this area so as to create a feeling of being appreciated and career growth among them (Ismail et al., 2018). Support systems are very critical due to a number of reasons since they help instructors overcome various challenges that would otherwise hinder the effective use of the same. Educators may encounter technical problems when using these tools therefore when there is no one to assist them at this point then their classes may come to a standstill.

Further, systems of support improve opportunities for educators being provided with a rich seam of learning materials. Institutions make it possible for instructors to learn on their own by availing all-round content that allows them to study using self-teaching methods hence gaining knowledge and skills needed in incorporating digital technology effectively into their teaching practices. These materials give power to instructors to try out new tools, methods, and approaches which will then help them be more competent digitally through enhancing their skills further with more practice of diverse strategies learned from these resources (Schulte et al., 2014).

EVALUATION AND FEEDBACK MECHANISMS

When it comes to evaluating the effectiveness of professional development programs for TVET educators, as well as assisting them to continually improve, assessment and feedback are important. These methods enable educators to consider their own learning progress, get advice from peers and supervisors, identify areas where more training is needed, and so on. Evaluation and feedback mechanisms include assessing how far an educator has gone with a program and what results have been achieved. They also involve giving responses to the educator concerned. This might be done through self-appraisal, peer evaluation, or supervisor appraisal. Self-assessment gives educators an opportunity to reflect on their digital competence levels, recognize strengths and weaknesses therein, and then set targets for future professional growth. Peer evaluation refers to assessments carried out by colleagues who have similar duties within the institution. It can take place in many forms such as observation sessions where best practices are shared among instructors while at work or even holding meetings targeting constructive

discussions towards this matter. This should be seen more as sharing ideas rather than criticizing each other's abilities because everyone has something different that he/she brings on board towards achieving common goals (Jacobs, 2019).

On the other hand, supervisor evaluation comes in handy especially when one needs guidance on areas requiring improvement besides support during his/her undertaking of this particular task thereby enhancing their overall ability (Tuytens & Devos, 2014). Additionally, ways in which evaluation and feedback mechanisms may be put into effect include various methods – regular meetings or check-ins with mentors, for instance. These provide platforms where individuals can air out their views freely without fear about anything else but moving forward together as far as realizing success is concerned. Again, they offer chances not only to receive directions from those who have much experience but also materials necessary for facilitating improvement since such people could be having them at hand based on past encounters faced while handling similar issues before now being shared again among others towards assisting them step by step until they become competent too (Culbertson, 2012).

When TVET educators want to enhance their digital competencies, evaluation and feedback mechanisms play different roles. One of the ways in which these mechanisms do this is through self-assessment which gives instructors a chance to think about how far they have come, what they are good at, and the areas where they need to improve. Doing so helps them understand their digital competencies better thus setting meaningful goals for professional growth (Yusop et al., 2022). Equally important, such practices create an enabling environment for learning among peers who share similar challenges and demands within the profession. This approach involves receiving comments from other instructors who may have different viewpoints based on varied experiences thereby broadening one's mindset through the exchange of ideas and sharing best practices (Wilkins et al., 2009). Additionally, it also allows educators to learn from each other's experience thus promoting continuous development in teaching skills or knowledge areas.

CONCLUSIONS

To sum up, this research sheds light on the degree of digital proficiency possessed by TVET instructors in Malaysian MTUN institutions. According to the research, TVET instructors generally have a modest degree of digital competency, with considerable disciplinary variance. Insufficient training is given to educators, and there is a lack of access to and use of digital technologies for teaching and learning. In order to improve digital competences among TVET educators in the industry, a number of difficulties, advantages, training requirements, and initiatives were discovered by the qualitative data analysis. The report emphasizes how crucial it is for TVET instructors' professional development to include digital capabilities in addition to procedures for evaluation and feedback, support networks, and assessment in order to promote ongoing progress. An evaluation and feedback mechanism, support systems, training and development programs, and an assessment of digital capabilities were the four primary components of a framework for professional growth that was suggested in light of the results. TVET instructors may improve their digital abilities by using the framework, which has subcomponents for each component and offers a holistic approach.

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AUTHOR CONTRIBUTIONS

Liu Jun Qiong: Conceptualization, Methodology, Formal analysis, Writing - Original Draft, Writing - Review & Editing.
Muhammad Khair Noordin: Supervision, Project Administration, Writing - Review & Editing.
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CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

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