

## **Digital Competency in Teaching and Learning of Building Construction Malaysian Skills Certificate**

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DOI: <https://doi.org/10.30880/ritvet.2023.03.01.015>

Received 31 March 2023; Accepted 04 June 2023; Available online 30 June 2023

**Abstract:** Nowadays, the digital teaching and learning approach is familiar in education. The need to provide digital teaching materials requires dynamic TVET instructor's competence. This study consists of three main objectives: identifying the competence of online teaching material development among teaching staff, the competence of online teaching delivery, and the implementation of the online assessment. Therefore, this study aimed to examine digital competence in implementing the teaching and learning of the Malaysian Skills Certificate in the construction field. The survey research design with a quantitative approach implements in this study. A questionnaire was distributed to Vocational Colleges in Southern Region also as Accredited Centre for Malaysian Skills Certificate in Building Construction. There are thirty respondents' responses to the questionnaire. The result shows identifying the competence in developing online teaching materials among employees with a mean value of 4.55, in contrast, determining the competence of online teaching delivery among teaching staff with a mean value of 4.38. In addition, identify how the teaching staff implements the online assessment with a mean score of 4.45. Therefore, this shows that digital competence in the implementation of teaching and learning Malaysian Skills Certificate is at a high level in the construction field. The ability of digital teaching and learning that is not directly face-to-face with students no longer needs to be doubted. Undoubtedly, digital teaching and learning can improve student performance better than face-to-face learning and produce quality graduates. In conclusion, digital competency requires preparing and implementing TVET teaching, and the teaching staff is aware of the new paradigm shift in TVET's pedagogical approach.

**Keywords:** Teaching Material, Teaching Delivery, Assessment

## 1. Introduction

Technical and Vocational Training Education (TVET) is a broad term that includes various forms of education and training that focus specifically on skills that can meet the needs of the job market and industry. In the preparation of RMK-12, the TVET focus group thinks that industrial training located in industrial premises is important, and it is seen to be more successful compared to training only in training institutions. The new government policy raises TVET to a higher level and is not considered one of second-class education. According to a newspaper clipping from Mohd Ridzuan (Sinar Harian, 11 October 2019), a total of RM5.9 billion has been allocated by the government to improve the implementation of TVET. Vocational education is very important because it is an initiative that can be the heart of developing a country.

According to He and Lee (2019), digital competence is related to the knowledge, capacity, and attitude of using digital technology, evaluating and creating learning information, and communicating with others for learning purposes. Therefore, Malaysian Skills Certificate or *Sijil Kemahiran Malaysia* (SKM) requirements among graduates are an important criterion to enable them to get a place in the job market, especially in the construction field. Ahmad Nabil (2012), states that the country really needs quality skilled workers, and the quality of skilled workers is evaluated by the industry. SKM is one of the skills certification programs that are guided by the National Occupational Skill Standard (NOSS). Skills certification is a recognition of skills graduates of Public Skills Training Institutions (ILKA). According to Faizal Amin Yunus et. al., (2015) have stated that achievements based on the candidate's ability to perform tasks categorized as 'task' and 'duty' in a certain job field by having SKM can prove that a person is qualified for that field. The teaching and learning method implemented now is more hands-on concept and when the pandemic situation changes, digital skills among teaching staff require drastic changes.

TVET education has become an important path for the country to produce highly skilled human capital because its graduates are capable of facing various cutting-edge challenges in the field of employment. Because of this, the advantages of TVET are clearly proven through theoretical and practical training, in addition to lifelong training schemes. Next, the concept of digital learning connects users that are customers with servers through the internet network. After the emergence of Covid-19 at the end of 2019, the teaching and learning process changed to fully online. Therefore, online learning that involves the use of information and communication technology (ICT) including mobile devices such as laptops and mobile phones as well as internet networks can be said to be in line with the agenda of creating a technology-based learning space for the current generation of students.

### 1.1 Problem Statement

Digital competence in the National Occupational Skills Standard (NOSS) TVET Instruction (TVET-I) covers several aspects namely teaching material, delivery, and assessment. The implementation of teaching and learning online in TVET has become a necessity to ensure learning in the 21st century. The problem in this study is the quality of learning delivered to students who follow SKM, does it follow the same standards as face-to-face learning when learning online line introduced. Furthermore, the problem continues when the quality of online learning has deficiencies and impacts on student evaluations and performance, especially hands-on learning. This is because SKM is more focused on the application of skills and techniques physically which requires students to apply techniques that can be found practically continuously. However, on the other hand, online learning is more focused on theoretical learning which causes the implementation of SKM digitally will cause the quality of students not to reach the quality it should be. The impact of the quality of learning being affected will cause the job market to start shrinking for students when the industry is hesitant to hire students to work because of the pandemic situation and the implementation of SKM digitally will test the ability of students to work with SKM certificates digitally. Therefore, based on the background that has been discussed, this study is to identify digital teaching competencies from the aspects of teaching

materials, delivery, and assessment among Malaysian Skills Certificate instructors at Vocational Colleges which are Accredited Centers (AC) registered in under the Skills Development Department (DSD).

## **2. Methodology**

This chapter will explain about the research methodology that will give an overview of the working method for conducting a study. The methodology is a research science to research to obtain and collect more accurate and systematic data. The methodology will ensure that the research performance can be achieved perfectly with the condition that all activities must follow the established procedures to achieve the objectives of the study. All work performed for data collection must be followed without skipping or neglecting procedures. Therefore, this study can help the researcher to continue the study more effectively, easily, and systematically in identifying digital competence in the implementation of teaching and learning in BC.

### **2.1 Research Design and Procedure**

According to Bhat (2021), the research design is a method chosen by researchers and needs to be used to solve a problem. This study uses the quantitative method of survey research design which is the purpose of data collection. In addition, according to (Rahman, 2020) the statistical approach can be used to confirm or deny the theory of phenomena that occur naturally. The researcher uses quantitative research design techniques to determine "why" a hypothesis exists as well as "what" the respondents want to say. The definition of "variable" is so important to quantitative analysis that its importance is often taken for granted by quantitative researchers. A quantitative approach using a survey design was adopted in this study. Questionnaire forms need to be distributed to SKM teaching staff in the field of Construction to assist in the data collection process. The selected population consists of 30 instructors of teaching staff in the field of Construction at selected AC in Vocational Colleges at Southern Zone.

This study is a survey research design and the methodology developed is also through the survey method, with the use of instruments that are suitable for the use of questionnaires. The content of this set has four parts namely:

- I. Part A: Demographics of respondents.
- II. Part B: Questions related to aspects of teaching materials.
- III. Part C: Questions related to teaching delivery aspects.
- IV. Part D: Questions related to aspects of assessment.

## **3. Results and Discussion**

The respondents involved are as many as 30 people who are construction technology instructors at five AC in Vocational Colleges from Southern Zone. The results will be analyzed descriptively, which is to compile a table that has the mean value of the score and the standard deviation.

The results of this study will answer the questions from the three objectives:

- I. Identifying the competence in developing online teaching materials among the instructors.
- II. Identifying the competence in online teaching delivery among instructors.
- III. Identify how online assessment is implemented by instructors.

### 3.1 Respondent's demography

**Table 1: Demographic of Respondents**

Demography	Profile	Frequency	Percentage
Gender	Male	12	40.0%
	Female	18	60.0%
Age	20 to 30 years	5	16.7%
	31 to 40 years	15	50.0%
	41 to 50 years	7	23.3%
	51 years and above	3	10.0%
Race	Malay	27	90.0%
	Chinese	0	0%
	Indian	0	0%
	Others	3	10.0%
Teaching experience	1 to 5 Years	7	23.3%
	6 to 10 Years	13	43.3%
	11 To 15 Years	7	23.3%
	16 Years and Above	3	10.0%
Level of education	Diploma	2	6.7%
	Degree	20	66.7%
	Masters	8	26.7%
	Doctor of Philosophy	0	0%
Malaysian Skills Certificate Level	SKM Level 2	4	13.30%
	SKM Level 3	12	40.00%
	DKM Level 4	8	26.70%
	DLKM Level 5	2	6.7%
	None	4	13.30%

### 3.1 Competence in developing online teaching materials among the instructors.

There are ten items that were asked in this section. Based on Table 2, the second item which is the preparation of notes related to teaching before the teaching and learning process recorded the highest mean score which is (Mean=4.70) followed by the third item which is providing material sharing platforms such as Google Drive, Telegram, WhatsApp and so on to students is the second highest item (Mean=4.67). Next, for the third highest item there are four items with the same mean score among which is the fourth item which is using e-books to find teaching information (Mean=4.60), the sixth item which is referring to teaching materials produced by other teaching staff as a guide for developing materials teaching (Mean=4.60), the eighth item which is to prepare video recordings to demonstrate practical work (Mean=4.60) and the tenth item which is to use PowerPoint, Canva, Google Docs, Google Form platforms in the teaching and learning process (Mean=4.60).

In addition, the fourth highest item is the seventh item which is to use multimedia resources from the internet to facilitate the production of teaching materials such as YouTube Downloader, sound, and others (Mean=4.53) followed by the fifth highest item is the ninth item which is to provide guidance to students on how to find information in the internet as a reference with the score value (Mean=4.43). Finally, for the sixth highest item, two items with the same mean score were recorded, namely the first item producing a video when teaching and learning is underway (Mean=4.37), and the fifth item, the use of the "Movie Maker" application platform to develop teaching materials based on multimedia (Mean=4.37).

**Table 2: Competence in developing online teaching materials**

No.	Item description	Mean	SD
1.	Produce video	4.37	0.556
2.	Preparing notes	4.70	0.466
3.	Provide learning material through Google Drive, Telegram, WhatsApp	4.67	0.479
4.	Use-book to retrieve the information	4.60	0.563
5.	Use Movie Maker application to develop teaching material	4.37	0.809
6.	Refer other instructor to develop teaching material	4.60	0.563
7.	Using other resources such as YouTube downloader, sound and others	4.53	0.571
8.	Produce the video recording about the practical work demonstration	4.60	0.563
9.	Provide guideline to student how to choose information through internet	4.43	0.568
10.	Using PowerPoint, Canva, Google Docs, Google Form, Google Sheet in teaching and learning process	4.60	0.563

Based on the analysis of the study that the researcher has done, the competency of developing online teaching materials among the workforce is high. and learning materials according to students' abilities, capabilities, interests, and talents. Identify the competence of developing online teaching materials with the highest mean value, which is the preparation of teaching-related notes before the teaching and learning process. According to Zulkifli (2018), practicing notes before a teaching session can guide teaching staff in guaranteeing the achievement of objectives for a teaching and learning session. This is important for teachers as preparation for teaching so that they can carry out everything planned systematically and more organized. Preparing teaching-related notes before the teaching and learning process is also necessary as evidence that the teacher has prepared before teaching. Furthermore, through this initial preparation, the instructor can increase self-confidence in teaching as planned. While the competence of developing online teaching materials at a moderate level is using multimedia resources from the internet to facilitate the production of teaching materials such as YouTube Downloader, sound, and others, teaching and learning materials can now be obtained not only from textbooks but can now also be obtained from internet materials, which is one of the great sources in contributing teaching materials currently. Therefore, the teaching staff needs to find the resource materials that help the teaching and learning process. In addition, the results of this study show that a minority of teachers produce videos during teaching and learning. According to Arfianawati et al. (2016), learning media such as video, which combines various multimedia, has been proven to increase interest and learning attitude towards the learning process.

### 3.2 Competence in online teaching delivery among instructors.

Based on Table 3, the item with the highest mean score is the second item which is using pictures and animation in the process online (Mean=4.53), and the sixth item which is diversifying delivery techniques (Kahoot, Quizzes, Padlet) to strengthen understanding in learning with the same mean score value (Mean=4.53). Next, the second highest item is the fifth item which is using a suitable and supportive platform to operate all learning communication platforms for example Zoom, Meet, Microsoft Teams applications (Mean=4.47).

Next, the eighth item is to give feedback between the teaching staff and the students when the online class is conducted. for example, Chatting Box, Telegram, and others (Mean=4.43) is the third

highest item followed by the fourth highest item the first item which is using a combination of text and graphic elements in the process online (Mean=3.37), and the ninth item that is, the use of "screen record" for the delivery process such as practical work (Mean=3.37) recorded the same mean score. Hence, the fourth item which is using social media applications to share and generate ideas with students (Mean=4.30) is the fifth highest item. Finally, the tenth item is the use of a "virtual whiteboard" to help the delivery process. For example, Jam board, Padlet, Whiteboard, Google Slide (Mean=4.23) is the sixth highest item and followed by the seventh highest item is the third item which is using "MP3" audio in the process online (Mean=4.10).

**Table 3: Competence in online teaching delivery**

No.	Item description	Mean	SD
1.	Using the online text and graphic	4.37	0.556
2.	Using online picture and animation	4.53	0.681
3.	Using MP3 audio	4.10	1.029
4.	Using social media to generate idea with student	4.30	0.596
5.	Operating online platform such as Zoom, Google Meet, Microsoft Teams in online class communication	4.47	0.571
6.	Various techniques to measure student's understanding such as Kahoot, Quizzes and Padlet	4.53	0.571
7.	Using YouTube	4.50	0.630
8.	Give feedback/reflection using chatting box, telegram and etc	4.43	0.626
9.	Using screen recording in practical work demonstration	4.37	0.765
10.	Using virtual white board; Jam board, Padlet, Whiteboard, Google Slide	4.23	0.728

The competence of online teaching delivery among teaching staff with the highest mean value, which is to diversify delivery techniques such as Kahoot, Quizzes, Padlet, and others to strengthen understanding in learning. According to Arbaa (2015), Teaching and learning in the 21st century is still teacher-centered, but teachers play a more critical role in actively involving students in learning activities. In the use of applications such as Kahoot, Quizzes, and Padlet; this is interactive learning that emphasizes pedagogy by applying the relationship between the active thinking of students and the content of lessons that emphasize attention, retention, and the purpose of student learning. This approach also provides immediate feedback that students can independently use new knowledge to solve problems, and they have more choices regarding assignments.

While the competence of delivering online teaching among teachers at a medium level is using a combination of text and graphic elements in the online process, according to Rusman (2012), The delivery of information to students through graphics is a faster method compared to delivery through full text, either in the context of reading or learning. At the same time, this graphic presentation method can attract students' interest and improve their memory. Considering the situation nowadays, a lot of material is published every day. Therefore, the material needs to be presented in an attractive form so that it tends to be read by the students. If seen, the human ability to interpret visual information is faster than written words. According to Yadav (2016), the visualization approach as a medium to improve student understanding can be carried out on students. In addition, the results of the study of this section show that a minority of teaching staff use "MP3" audio in the online teaching process. Asyhar (2015)

defines audiovisual media as a type of media used in learning activities that involve hearing and vision simultaneously in one approach or activity. Audiovisual information technology is any analog or digital technology that combines sound and graphics or sound and video. The field of audiovisual education is referred to as teaching using audiovisual aids. Audiovisual media is an intermediate media or the use of materials and their absorption through sight and hearing to form an atmosphere that can enable students to acquire knowledge, skills, or attitudes.

### 3.3 Online assessment is implemented by instructors.

A total of 10 questions were asked in this section. The researcher analyzed this section in detail using the mean score and standard deviation as shown in Table 4. Once the items are analyzed, the researcher will get a mean value to identify the method used to carry out the online assessment among Malaysian Skills Certificate instructors in the field of construction. Based on Table 4, the item with the highest mean score is the fourth item, which is the teaching staff providing a platform for students to upload assessment answers. for example, Google Drive, Teams, and others (Mean=4.63). Next, the second highest item is the first item which is Using assessment platforms such as Quizizz, Kahoot, Quizlet Live, Edmodo (Mean=4.57) followed by the second item which is using Google Meet, Team, and other platforms for practical assessment with a mean score value (Mean =4.53) is the third highest item. Therefore, the fourth highest item is the sixth item which is to perform an oral test on Google Meet, Team, and other platforms (Mean=4.47) and the seventh item is to give subjective questions and upload the answers on the platform provided (Mean=4.47) recording the mean score the same followed by the fifth highest item is the third item which is the teaching staff carrying out evaluation through student interaction sessions through Meet, Team, and others (Mean=4.40). Finally, for the fifth item, which is the teaching staff using the "online polls" method for assessment activities, the mean score value (Mean=4.13) is the sixth highest item in this section.

**Table 4: Assessment in online teaching delivery**

No.	Item description	Mean	SD
1.	Using online assessment tools such as Quizizz, Kahoot, Quizlet Live, Edmodo.	4.57	0.626
2.	Using online platform such as Google Meet, Microsoft Teams in practical work assessment	4.53	0.571
3.	Interaction with student using Google Meet, Microsoft Teams	4.40	0.621
4.	Student upload answer sheet using google drive, shared folder	4.63	0.615
5.	Using online polls in assessment activity	4.13	0.900
6.	Oral evaluation using Google Meet, Microsoft Teams	4.47	0.571
7.	Upload question through learning platform provided	4.47	0.571

Based on the analysis of the study that the researcher has done, the online assessment carried out by the teaching staff is at a high level. According to Mohamad Hanapi et al. (2019), the implementation of student knowledge assessment must be in-depth, comprehensive, meet measurement criteria, and be structured because it can influence the level of the teaching staff's pedagogical practice. Identifying how the teaching staff carries out the online assessment with the highest mean value, for the teaching staff provides a platform for students to upload the answers of the evaluation, for example, Google Drive, Teams, and others. This puts an additional burden on the teaching staff to handle the exam within the time limit available. Therefore, instructors can send questions through the website, and students will answer and send their answers online through internet networks such as Google Drive, Teams, and others.

While teachers carry out the online assessment at a moderate level, they use Google Meet, Team, and other platforms for practical evaluation. According to Farrah Dina Yusop (2018), the online assessment method is more student-centered, and the learning time is more flexible. This platform is a video conferencing or online meeting service and is a great alternative. Implementing practical assessment that provides appropriate characteristics to be used in the student assessment process. In addition, this platform has a security aspect, where only the host can have full access in a meeting to prevent other users from entering without permission. In addition, the results of this study show that a minority of teaching staff use the "online polls" method for assessment activities. The Ministry of Education encourages teachers to use a variety of learning strategies that can be used to test students' understanding. However, using "online polls" as an evaluation method by teaching staff has received little attention and is rarely implemented.

#### **4. Conclusion**

In TVET digital competency is vital to teaching and learning. TVET emphasizes giving students the information and practical skills needed for industries and professions. To ensure that students are ready for the demands of the modern sector, TVET programs must include digital competencies. TVET instructors are more prepared to improve their teaching strategies and effectively engage students when they possess digital proficiency. Using digital resources, teachers can design interactive classes, combine multimedia content, and offer specialized learning opportunities. They can use online tools for evaluations, comments, and tracking student progress. This not only improves learner outcomes but also supports efficient administrative processes. Digital competency enables TVET institutions to offer flexible and blended learning approaches. Learners can access educational content and resources anytime, anywhere, allowing for self-paced learning and accommodating diverse learning styles. Blended learning combines online and face-to-face instruction, providing a balance between theoretical knowledge and practical skills development. TVET plays a vital role in addressing socioeconomic inequalities by providing skills and opportunities for individuals from diverse backgrounds. By integrating digital competency, TVET institutions can help bridge the digital divide by ensuring that all learners have access to and can effectively utilize digital technologies. This inclusivity promotes social and economic empowerment. To achieve these benefits, TVET institutions should invest in infrastructure, training for instructors, and curriculum development that incorporates digital competency.

#### **Acknowledgment**

The author would like to express appreciation to the Faculty of Technical and Vocational Education, Universiti Tun Hussein Onn Malaysia

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