AJVAH
e-ISSN: 2735-1165
DOI: https://doi.org/10.53797/ajvah.v4i1.2.2023

# Suitability of Web Development Technology Course in TVET Tertiary Educators' Perspective

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Received 07 December 2022; Accepted 15 June 2023; Available online 03 July 2023

**Abstract:** This study will cover on how Web Development technology can be adapted in digital education for higher learning environment from a TVET's computing lecturers' perspective including the expectation of learning outcomes by teaching this technology. The respondents have been selected from the computing lecturers of polytechnics and community colleges where both institutions are major players in TVET field. The findings and results have been measured through a questionnaire method involving the information of lecturers' demographics, duration of working, academic qualification, readiness aspects such as technology suitability, delivery ability, skills and knowledge, certified requirement, and supportive infrastructures. This study also covers in aspects of target and learning outcome for the students in terms of knowledge, teamwork, awareness, and skills. The outcome has stated that most of the respondents agreed that the course is suitable in a tertiary education perspective but with the improvement to the related elements like readiness and infrastructure to meet the needs so the course can be implemented at the optimum level.

**Keywords:** Web Development, TVET, Higher Learning, Learning Outcome

## 1. Introduction

Web Development technology is a common element in computing towards digitalization environment. Most of our lifestyles with a new norm adaption require us to perform various tasks over the web platform. This is inclusive of implementation for the teaching and learning process via online conference tools, organization and company meeting, submission of student's assignment to goods and products buying. Those situations show that the web technology applications become a crucial need to peoples to manage their daily routines. Specifically, a web application is accessed with a web browser as a client and provides the ability to update and maintain a program without deploying and installing software on client's computer (Botwe, David & Davis, Joseph. 2015). The facts show that more than 500 million people communicate and keep in touch with friends through social networking (Hatch, Kristina E. 2011). Besides, the literation for this technology needs to be improved at early age of generation. As such, this kind of technology needs to be exposed to the various level of learners regardless to higher learning institutions, skill institutions, secondary schools and also for level two of primary school's students. Schools and the education of children should undergo an extensive digital transformation to be able to meet the needs of the young generations and their digitalized future (Netta Iivari, Sumita Sharma, Leena Ventä-Olkkonen. 2020). Given the potential of web development for earlier stages of computing education, the goal of our study is to understand how it can effectively serve this purpose ( Park, Thomas & Wiedenbeck, Susan. 2011). However, the delivery process for this element into the ground education environment is quite interrupted by the common issues of capability, skills and infrastructures. Hence, this study has been conducted to know how literate the educators and to view the related facilities need to be provided in supporting the delivery process of this technology to the students.

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## 1.1 Literature Review

Technology can be referred to an application of a scientific method for practical purposes that use knowledge dealing with engineering or applied science. While web technology which is described as intelligent systems, will create added value in many different areas of daily life from entertainment to education. This process is thought to bring many advanced technology products such as intelligent personal agents, robots, intelligent homes and smart cars (Tekdal, Mehmet & Sayginer, Şenol & Baz, Fatih. 2018).

### 1.1.1 Web Development

When certain applications are created and need to be operated over the web, they must apply most of the related features that comply with the web environment. The development of the web-based application is the work involved in developing a dynamic web page for the Internet or an intranet. Among web professionals, "Web development" usually refers to the main non-design aspects of building websites including writing markup and coding. (Campbell, Jennifer 2017). This technology of development comes with a set of approaches and algorithms which are required to be applied to produce a proper web application. In such cases, development for the web application involves with other methods such as programming, coding, designing and deploying.


**Fig.1: Web Development Method**

## 2. Research Method

To uncover how the adaptability and literation in learning web development technology influence the tertiary education perspective, research activities including data collection has been conducted through a questionnaire distributed to 49 respondents while the data analysis has been performed used SPSS software. The questionnaire was tested for validity with a reliability value 0.98.

## 2.1 Data Collection

The growing use of the Internet offers new ways of collecting data, but trials using web-based questionnaires have so far seen mixed results (Ebert J, Huibers L, Christensen B, Christensen M. 2018) In this study, the process of collecting data from specific respondent has been conducted through an online mechanism using Google Forms platform. This form which is created as a web-based questionnaire contains a certain number of related questions distributed to the groups of lecturers from polytechnics and community colleges as both are the main player in TVET's tertiary institution. A brief explanation of Google Form can be found in Appendix A.


**Fig.3: Online questionnaire platforms**

Data were collected from 3 sections of the question as for respondent demographic, readiness for technology implementation and the learning target affected student's outcome. These sections comprise 49 lecturers and total of 49 responses were recorded by the google form.

**Table 1: Respondents Profile**

| Category | Variables |
|---|---|
| ***Demographic*** | |
| Gender | Male<br>Female |
| Working Duration/ | < 1 year |
| Experience | 1-5 years<br>5-10 years<br>> 10 years |
| ***Background*** | |
| Qualification | PhD<br>Master's degree<br>Bachelor's Degree<br>Diploma |
| Qualification Field | Software Engineering<br>Multimedia<br>Information System<br>Networking<br>Web Development<br>Information Technology<br>Others |

## 2.2 Data Analysis

To this data, content analysis, a technique for making valid and reliable inferences "from texts (or other meaningful matter) to the contexts of their use" (Krippendorff, K. 2004) has been applied. Each response was directly collected but was examined further to determine the result based on the group of tendencies and interests. In such cases, the response is categorized into the appropriate numbers of parts to simplify the result. The first part of the question, analyzing for

respondent profiles being evaluated. This is for the researcher to set a basic information about the strength owned by the educators and lecturers. These analyzations are summarized in Table 2.

**Table 2: Question Category**

| Category | Description |
|---|---|
| Demographic | Asking question about gender and working duration or experience |
| Qualification | Asking about academic qualification and qualification field |
| Readiness | Asking about course suitability, teaching willingness, skills and knowledge |

For the second research question, examination for the outcomes or learning target being analyzed. This analyzation is to know the effectiveness and what will the students constructively get from this course implementation. Analyzation process was conducted via Likert Scale with certain measurement variables as summarized in Table 3.

**Table 3: Likert Scale Indicator**

| Score | Scale | Indication |
|---|---|---|
| 1 | Strong Disagree | Negative |
| 2 | Disagree | |
| 3 | Not Sure | Neutral |
| 4 | Agree | Positive |
| 5 | Strong Agree | |

Then, each score will be calculated to find out whether the positive or negative result has been determined. In this case, each calculated score value matched the min value respectively to find out the deviation standard level.

**Table 4: Min Value Level**

| Min Value | Level |
|---|---|
| 1 to < 2.33 | Low |
| 2.33 to < 3.66 | Average |
| 3.66 to <= 5.00 | High |

# 3. Result and Discussion

## 3.1 Educators and Lecturers

### 3.1.1 Demographic

This following data is collected from polytechnic and community college lecturers in the eastern region consisting of PSMZA, PKT, PBT and KK Kemaman with the value of n=49 as n for respondent number. Part A (4 variables) including gender, working duration, qualification and field. The data as shown in Table 1 indicate that 77.6% represent female respondents and the rest 22.4% represent male respondent. For duration of working, 2.0% represent 1 to 5 years of experience, 8.2% represent 5 to 10 years of experience while 89.8% have more than 10 years of experience.

**Table 5: Respondents Demographic**

| | | Frequency | % |
|---|---|---|---|
| **Gender** | Male | 11 | 22.4 |
| | Female | 38 | 77.6 |
| **Working Duration/ Experience** | < 1 year | 0 | 0 |
| | 1-5 years | 1 | 2 |
| | 5-10 years | 4 | 8.2 |
| | > 10 years | 44 | 89.8 |

The data as stated in Table 6 indicate that 22 respondents are master's degree holder while another 28 respondents are bachelor's degree holder and only 5 respondents are the Diploma holder. From the part of the qualification, there are 12 respondents from the Software Engineering field, while 8 of them in Multimedia field, and 19 respondents in the Information System field, 5 of them in the Networking field, another 5 of them in the Web Development field, 2 respondents each with Information Technology field and Information Science field and the rest of 4 respondents are in the others field of qualification.

**Table 6: Field of qualification**

| | | Frequency | % |
|---|---|---|---|
| **Qualification** | PhD | 0 | 0 |
| | Master's degree | 22 | 44.9 |
| | Bachelor's Degree | 28 | 57.1 |
| | Diploma | 5 | 10.2 |
| **Qualification Field** | Software Engineering | 12 | 24.5 |
| | Multimedia | 8 | 16.3 |
| | Information System | 19 | 38.8 |
| | Networking | 5 | 10.2 |
| | Web Development | 5 | 10.2 |
| | Information Technology | 2 | 4.1 |
| | Others | 4 | 8 |

3.1.2 Readiness

The definition of technology readiness is the set of capacities to plan for, catalyze, sustain, and monitor and report on technology transfer and development [6]. This part of the study will be evaluated the readiness level of educators regarding the aspects of the suitability of Web Development Technology course, related infrastructures, willingness to teach, skills and knowledge. All those aspects are evaluated with Agree or Disagree indication.

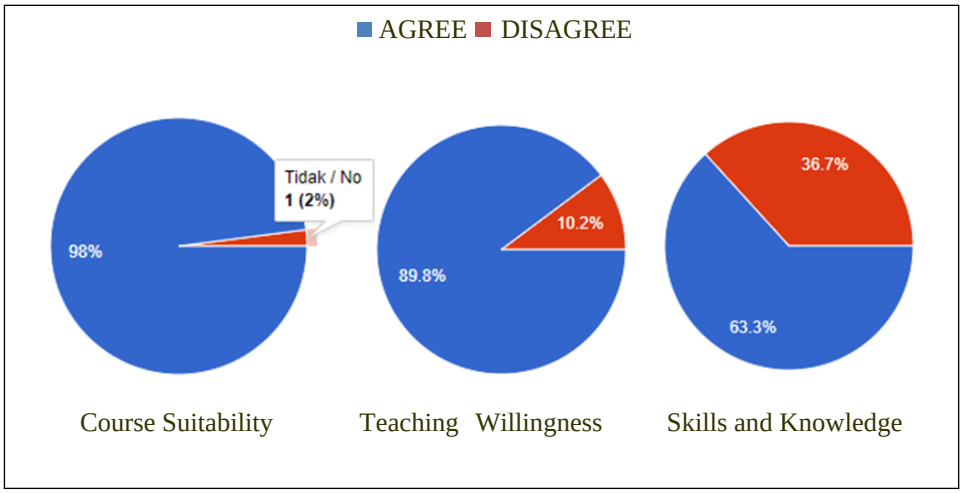


**Fig.4: Readiness Factors**

From the review, data shows that about 98% of respondents 'agreed' that this course is suitable for TVET higher learning environment while another 2% 'disagreed'. Besides, the willingness to teach stated that 89.8% will and only 10.2% disagree to teach this course. About 63.3% of respondents 'agreed' that they have related skills and knowledge while only 36.7% responded 'disagreed' with that aspect. Nevertheless, about 93.9% of respondents 'agreed' to the aspect of the certification requirement for educators to become certified with this course and just 6.1% 'disagreed' with it.

**Table 7: Readiness Factors**

| Item | Percent | | Frequency | |
|---|---|---|---|---|
| | Agree | Disagree | Agree | Disagree |
| Course Suitability | 98.0 | 2.0 | 48 | 1 |
| Teaching Willingness | 89.8 | 10.2 | 44 | 5 |
| Current Skills and Knowledge | 63.3 | 36.7 | 31 | 18 |

In the aspect of infrastructures, most of the respondents 'agreed' with following respective facilities are 29 respondents (59.2%) for Seminar Hall, 48 respondents (98%) for laboratory facility, 36 respondents (73.5%) for the lecturer room, 43 respondents (87.8%) for th technology-enabled classroom, 39 respondents (79.6%) for networking facility and 48 respondents (98%) for upgraded computer facility.

**Table 8: Facility and Infrastructure**

| Item | Percent | | Frequency | |
|---|---|---|---|---|
| | Agree | Disagree | Agree | Disagree |
| Seminar Hall | 59.2 | 40.8 | 29 | 20 |
| Laboratory | 98.0 | 2.0 | 48 | 2 |
| Lecturer Room | 73.5 | 26.5 | 36 | 13 |
| Technology-enabled Classroom | 87.8 | 12.2 | 43 | 6 |
| Network facility | 79.6 | 20.4 | 39 | 10 |
| Computer facility | 98.0 | 2.0 | 48 | 2 |

3.1.3 Target and Learning Outcome

Web-based technologies are certainly revolutionizing education so their effectiveness still can be determined. The effectiveness factor is not merely about the adaptability level but also involve how educators need to examine the instructional strategies to deliver this course in the class to improve student acceptance (Khalifa, Mohamed & Lam, Rinky. 2002). The effectiveness factors that were examined via questionnaire in this study consist of knowledge (4 tested variables), teamwork (3 tested variables), awareness (5 tested variables) and skills (3 tested variables). In this case, the study used a Likert Scale with 5 types of scores which has been divided into 3 parts of effectiveness indicator Positive, Neutral and Negative. From the findings, the result for each tested factor matches the high level of min value. Table 7 shows the min score and value.

**Table 9: Min value and Score Result**

| Scale | No. Of respondents (N=49) | | |
|---|---|---|---|
| | Tested Variables | Min | Deviation Standard |
| Knowledge | Able to apply mathematical knowledge in Web Development | 3.89 | Min = 4.00 |
| | Able to apply science knowledge in Web Development | 3.92 | |
| | Able to apply electronics and basic computer knowledge in Web Development | 4.06 | |
| | Able to apply an engineering knowledge in Web Development | 4.16 | |
| Skills | Able to solve a Web Development related problem | 4.22 | Min = 4.19 |
| | Ability to use analytical thinking in analyzing information, issue and Computer Science related problem | 4.20 | |
| | Effectively communicate among the Computer Science community and the public | 4.16 | |
| Teamwork | Working individually | 4.18 | Min = 4.18 |
| | Working in team | 4.26 | |
| | Able to lead a working team | 4.10 | |
| Awareness | Understand the professional ethics in Computer Science | 4.24 | Min = 4.14 |
| | Aware of the continuous development of requirement | 4.10 | |
| | Aware of the entrepreneurship requirement | 4.06 | |
| | Aware of the professional development of requirement | 4.18 | |
| | Aware of life-long learning requirement | 4.14 | |

## 4. Conclusion

In this study, the investigation is for the suitability of the Web Development Technology course in higher learning perspective for TVET's institution. The suitability factor has been viewed in the aspect of readiness and learning outcome that should be achieved after the completion of this course. Meanwhile, a certain suggestion for the supported facilities shows that this element is quite important to make the delivery process more reliable. Indeed, these facilities need to constantly be maintained to remain useful and function. For the part of readiness, the results from the questionnaire show that most of the educators agree to indicate that this course is suitable in TVET's higher learning environment. Meanwhile, the results for target or learning outcome assigned that this course effectively helps the student regarding the ability to empower knowledge, skills, teamwork and awareness attitude. Nevertheless, technology readiness still has a stronger positive influence on teaching and learning presence. Prior training or briefing on learning technologies or platforms would potentially improve students' perception of teaching presence. Hence, the need for providing a series of workshops and related seminars should be considered by the institution authority to enhance the educator ability in becoming more literate with the latest and up to date web development technology.

### Acknowledgement

The work has been carried out at the Politeknik Sultan Mizan Zainal Abidin Terengganu for the new program suggestion of Information Communication Technology Department We are grateful to the Politeknik Sultan Mizan Zainal Abidin Terengganu and the polytechnic and community college staff for the support in providing all the materials for this study.

### Appendix A: Explanation of Google Form

An online free software that allows you to create surveys, quizzes and questionnaire. It is part of Google's web-based application suite, including Google Docs, Google Sheets and Google Slides. It is a versatile tool that can be used for various applications, from gathering RSVPs for an event to creating a pop quiz. If you want to create a form, you need a Google account to create it, while as a creator, you can let anyone fill it out, meaning no Google account is required.

### Appendix B: Example of Course Learning Outcome (taken from Polytechnic Course)

COURSE LEARNING OUTCOMES (CLO)

| CLO | ITEM |
|---|---|
| CLO01P | Construct the PHP program structure, file and directory handling, database connectivity appropriately in developing dynamic web page that connected to MySQL database |
| CLO02A | Demonstrate effective communication both orally or writing in developing secured dynamic web application |
| CLO03P | Display the ability to visualize the development process web application |

Cetak Format HTML | DOC

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