Penerbit Akademia Baru

Journal of Advanced Research in Technology and Innovation Management

Journal homepage:
http://www.akademiabaru.com/submit/index.php/artim/index
ISSN: 2811 - 4744

Vocational College Management System (VCMS): An Innovation Project

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ABSTRACT

The development of digital technology plays an important role in various human activities including the field of higher education. One of the uses of digital technology in management affairs such as examination management at Vocational College (KV). College Vocational Management System (CVMS) is a web-based Academic Management System for the use of Malaysian Vocational Diploma (DVM) at Pasir Mas Vocational College which was developed by the expertise of trained lecturers. This CVMS system was completed in January 2019. The problem faced by most lecturers is not having an efficient system that can facilitate exam management. Vocational College Management System (VCMS) is a KV examination management system developed to facilitate examination administration at KV. A survey involving 480 users of the VCMS system and findings related to the usefulness and ease of use of the VCMS system showed that the reaction of the majority of respondents was at a high level. However, from the aspect of readiness, there are several factors that cause VCMS users to be less interested in using it. The highest factor is the internet factor which is less satisfactory in most KVs which recorded a value of 62.5% of respondents. In addition, other factors that contribute to the problem of readiness to practice the VCMS system are lack of skills in the field of digital technology (attitude problems, task overlap problems, complicated system problems (complicated) and lack of training and exposure to the VCMS system. This finding shows that the behavior technological readiness is strongly influenced by four factors namely optimism (optimism), innovativeness (innovativeness), discomfort (discomfort) and anxiety (insecurity) in the Theory of Reasoned Action (TRA) and also has a relationship with the factors of usefulness (usefulness) and ease of use (ease of use) which is recommended in the Technology Acceptance Model (TAM).

Keywords:
Technology readiness; VCMS; TRI; TAM; digital technology

Received: 19 Feb. 2024 **Revised: 20 Mar. 2024** **Accepted: 22 Apr. 2024** **Published: 1 Jun. 2024**

1. Introduction

The growing demands of digital technology in education in the 21st century bring a new set of challenges and pressures. There is a global trend to transform the field of education to a more innovative form of practice Hossain *et al.,* [3]. In the field of higher education there are also a number of lecturers and students who do not use information technology facilities provided by educational institutions because they are not ICT literate and some do not have the funds to buy technology hardware and software Panday & Purba [10]. Most of the lecturers face the problem of not having

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digital equipment or hardware that keeps up with the development of technology and not getting balanced and fair training opportunities [3].

In Malaysia, Vocational College (KV) is an institution under the Malaysian Ministry of Education (KPM) which is responsible for providing exposure to students through skills. A total of 84 Vocational Colleges have been established throughout Malaysia. This directly opens up opportunities for young people who want to venture into Technical and Vocational (TVET) fields. TVET stands for Technical and Vocational Education and Training. It is an educational and training process that has a job orientation with a major emphasis on industry practice.

As an educational institution, KV also does not miss to move along with the development of digital technology and has developed an examination management system known as VCMS. The VCMS system was designed and introduced to coordinate the administration and management of examination and assessment data across all KV campuses. This initiative is an effort to utilize ICT to improve the quality of examination management in Malaysia as contained in the Malaysian Education Development Plan 2013-2025 KPM [4].

1.1 Vocational College VCMS System

The VCMS system at KV was first introduced in 2019 only for the use of Pasir Mas Vocational College which was originally invented to facilitate the management of online examinations and evaluations for lecturers and students. However, at that time the management of examination and evaluation data was still managed by the Vocational College Assessment Documentation Application System (ADOPV) which was developed for the purpose of coordinating the score management process as well as student assessment and evaluation reporting to a standardized and uniform standard in all institutions implementing the Malaysian Vocational Certificate program (SVM) and Malaysian Vocational Diploma (DVM). It aims to avoid any mistakes in changing the assessment score as well as help the teaching staff to identify the continuous assessment achievement of the students in order to implement any necessary follow-up actions or interventions.

Due to the weaknesses found in the ADOPV system, the VCMS was created and designed by Pasir Mas Vocational College lecturers and then continued to be developed over time in stages. Now, VCMS has been equipped with a module for dealing with course registration and student exams, lecture attendance records, input and processing of assessment marks by lecturers, building exam schedules, appointing exam invigilators, generating exam qualification slips, generating exam reporting and evaluation, announcing exam results and student assessment, curriculum assessment, until generating the final transcript of the overall student assessment results.

Despite this, based on the preliminary survey there are some problems related to the implementation of the use of VCMS that interfere with the objectives and goals of the development of this system (see Figure 1). Among the problems identified is that there are lecturers who enter the current requirements data into the system too late, and pass the deadline that has been set. For example the entry of late assessment marks. There are also lecturers who do not record student lecture attendance into the system, i.e. by simply recording attendance conventionally on a printed form.

This VCMS system is expected to gain attention and be used comprehensively in the future not only at KV but for other educational institutions. This is because VCMS is the first examination management analysis system of its kind in Malaysia.

Fig. 1. System VCMS of KV

The implementation of VCMS until this research is done has received positive feedback and is in the attention of the Ministry of Education, especially the Vocational Technical Education and Training Division to use fully in the future.

The high commitment shown by all members of the Pasir Mas Vocational College, especially the cooperation from the Program Leaders, has helped the success and smoothness of the VCMS system. Any improvements are made from time to time based on the feedback received and can be implemented with modifications as needed. VCMS system expansion was implemented in June 2020 by upgrading the system to version 2.0. The implementation of phased VCMS expansion is as in Table 1.

The innovation project implemented focuses on online information management to monitor the implementation and record keeping of Continuous Assessment (CP) of students, helping to generate an analysis of student achievement quickly in terms of Course Learning Outcome (CLO) and Program Learning Outcome (PLO) next. also help in producing Continuous Quality Improvement (CQI) in Vocational Colleges where this analysis is very necessary in accreditation by Malaysian Qualifications Agency (MQA) and Malaysia Board of Technologists (MBOT). This innovation can also help the management of programs and lecturers at the Vocational College more effectively and efficiently.

Table 1
VCMS expansion implementation

No.	Year of Implementation	VCMS Version	Vocational College
1.	2019	1.0	KV Pasir Mas Information Technology Program Business Management Program Marketing Program Retail Management Program Banking Program Administrative Secretarial Program
2.	2020	2.0	KV Besut Information Technology Program Tourism Management Program Culinary Arts Program Electrical Technology Program Construction Technology Program Welding Technology Program Machining Technology Program Refrigeration and Air Conditioning Technology Program Automotive Technology Program
3.	2021	2.0	KV Kuala Krai Information Technology Program 3D Animation Art Program Graphic Technology and Print Media Program Electrical Technology Program Electronic Technology Program Welding Technology Program Machining Technology Program Refrigeration and Air Conditioning Technology Program Automotive Technology Program
4.	2022	2.1	KV Tanah Merah Electrical Technology Program Electronic Technology Program Welding Technology Program Machining Technology Program Refrigeration and Air Conditioning Technology Program Automotive Technology Program Tourism Management Program Construction Technology Program Culinary Arts Program Fashion Design Art Program Early Childhood Education Program Cosmetology Program Bakery and Pastry Program
5.	2023	3.0	KV Kemaman KV Wakaf Tembesu KV Dungun KV Temerloh KV Kulim KV Sultan Ahmad Shah Rompin KV Pengkalan Chepa KV Kuala Berang KV ERT Setapak

1.2 Features of VCMS

VCMS was developed using the concept of a Database System which is a system that has three main components namely the database, the database management system and the application.

i. The VCMS database placed in the server allows the data to be shared by more users because the VCMS system operates online which can be accessed through all browsers such as Internet Explorer 5.0 and above, Mozilla Firefox 5, Opera 9, Safari, Chrome and others using laptops, desktop computers, tablets and smart phones.
ii. VCMS uses a database management system from the NoSQL (Non SQL/Not Only SQL) category that does not involve relationships and SQL (Structured Query Language). This means that the VCMS database has a more flexible structure by using the format that best suits the data, which is not in the form of rows and columns. So, any changes to the database structure of the VCMS system can be done quickly and easily. The use of NoSQL also allows queries or command queries in the VCMS system to be executed more quickly.
iii. The applications chosen to develop this VCMS system are Text Editor Atom, PHP, Javascript, Bootstrap, CSS, HTML5 and several other applications. The selection of this application is compatible with the types of systems that have been developed before.

1.3 Problem Statement

In this century, information management in educational institutions in Malaysia is also implemented using digital technology, in line with the latest technological developments. Various digital systems or applications are developed for the management of the education sector to be more efficient and effective. Every institution needs to implement initiatives and strategies to improve service quality while testing and analyzing existing strengths and weaknesses in order to improve efforts to bring them to a better position Mustapha *et al.,* [5]. But despite the efforts made, there is a problem to determine whether the user's acceptance of the developed system is successful or not.

Based on some literature reviews, it was found that when a new digital technology is developed, most users refuse and do not easily accept it [6]. Based on this factor, it is felt that this needs analysis study is important to carry out because based on experience and observation, the researcher found that further exploration and analysis needs to be done to see that this VCMS system is accepted by users, further improving the efficiency of information management, especially inspection and evaluation information in KV.

1.4 Research Objective

Based on the research questions that have been identified, the researcher has determined the objectives of the study as follows:

i. Measuring the level of acceptance of the VCMS system among KV lecturers.
ii. Identify the factors that determine the level of acceptance of the VCMS system.

1.5 Research Questions

This needs analysis study was carried out specifically to collect information related to the implementation of the VCMS system at Vocational Colleges that have been using it until December 2023. As such, the researcher has identified several research questions as follows:

i. What is the level of acceptance of the VCMS system among KV lecturers?
ii. What are the factors that determine the level of acceptance of the VCMS system?

1.6 Literature Review

In this section, the researcher will discuss the literature related to the objective of this study, which is to measure the level of acceptance and identify the factors that determine the level of acceptance of the VCMS system. Table 2 below shows the findings of several literatures that discuss the factors that influence the level of user acceptance of the new technology introduced.

Table 2
Literature review related to technology acceptance factors

Author	Affecting factor
Arifin & Sukmawidjaya [1], Mustapha *et al.,* [5]	Lack of knowledge
Hossain *et al.,* [3], Mosa *et. al.,* [7], Mustapha *et al.,* [5]	Infrastructure problems, lack of training, hardware
Panday & Purba [10], Nugroho & Fajar [8]	Intention, optimism and innovation

According to Arifin & Sukmawidjaya [1], the lecturer's high knowledge and skills about the use of technology will lead to the learning process going smoothly, and students will be eager to learn. The ability to use technology can explore teaching and learning, which in turn will affect student achievement. A problem that often occurs is that lecturers who lack knowledge about digital technology will continue to carry out conventional teaching and learning. The use of digital technology in management tasks also requires knowledge to operate a system. Most individuals who are less competent about technology will always find an excuse not to use the new system introduced.

Digital technology infrastructure and hardware such as internet access networks, wireless connection facilities (wifi), servers (servers) of a system, computer sets and so on that do not work well will cause users to quickly feel bored and not interested in using a system introduced. Poor internet access will cause the computer or device connection to the system server to always be disconnected and the data entered cannot be saved Hossain *et al.,* [3]; Mosa *et al.,* [7].

According to Panday & Purba [10], the aspect of intention, optimism and innovation to use digital technology in a job done, will encourage an individual to practice it continuously. These three aspects will apply the positive acceptance of users to the new technology introduced. Although the new technology has properties or characteristics that have never existed in existing technology, with aspects of intention, optimism and innovation will cause users to be more motivated to explore it [11].

1.7 Technology Acceptance Model (TAM)

Technology Acceptance Model (TAM) is one of the most influential models in the study of information technology acceptance Lee and Lin [6]. This theory is a theory developed from the Theory of Reasoned Action (TRA) by Ajzen and Fishbein. TAM was first introduced and built by Fred Davis in 1986 [2].

The main objective of TAM is to explain the determining factors of technology acceptance in general. In addition, it also translates user behavior when faced with various digital technologies by not only making assumptions but also explaining why a system developed can be accepted or rejected.

The main purpose of the TAM model introduced is to provide a basis for identifying the effects of external factors on the internal influence of individuals such as attitudes, beliefs and behavioral intentions. The TAM was constructed and designed to measure this impact by assessing several underlying variables suggested by previous research on the cognitive and affective acceptance of computer technology.

This model, as depicted in Figure 2 suggests that when consumers are presented with a new innovation, several variables influence their decision on how and when they will use it. TAM places computer use determined by the intention to use the system, while the intention to use the system is determined by a person's attitude towards the use of the system and response to its use [12].

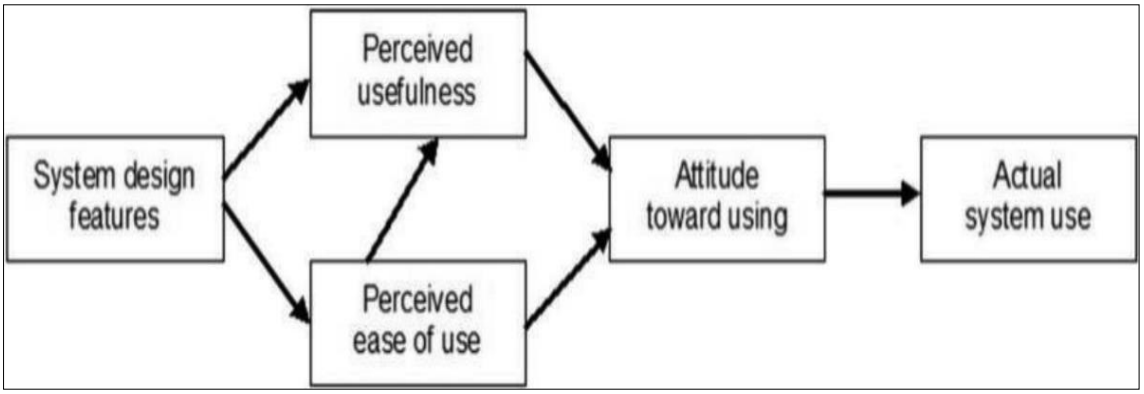

Fig. 2. Technology Acceptance Model

2. Methodology and Methods of Data Collection

This needs analysis study is carried out quantitatively by collecting descriptive data. The questionnaire instrument was distributed online through google form. A set of structured open questionnaires consisting of 3 questions has also been used in order to obtain a more extensive response. The researcher has successfully collected instrument clean data from 480 VCMS system users which has involved 6 Vocational Colleges in the State of Kelantan. The data obtained was analyzed to see the level of acceptance of the VCMS system and the factors that determine the level of acceptance of the VCMS system. Percentage and mean data are used to explain the findings of the study.

3. Findings

The results of this needs analysis questionnaire are divided into 3 main parts, namely (1) the construct of perceived usefulness (PU), (2) the construct of perceived ease of use (PEU) and (3) a structured open questionnaire.

The results of the data analysis of part 1, which is the construct of perceived usefulness, are shown in Table 3.

Table 3
User responses about the usefulness of the VCMS system

The construct of perceived usefulness (PU)	Mean
1. Using the VCMS system, my tasks can be completed more fast.	4.358
2. By using the VCMS system my tasks can be completed with easy.	4.379
3. My work productivity is improving by using the system VCMS	4.190
4. The use of the VCMS system can improve my work efficiency	4.242
5. I found that the VCMS system is very suitable for my field of work	4.342
Average mean	4.302

Based on the findings of the perceived usefulness (PU) construct, it was found that the mean average value was 4.302. The mean average value that exceeds 4,000 means that the feedback from the respondents of a questionnaire shows a very positive value. This proves that the VCMS system is certified as useful by the lecturers.

The results of the data analysis of part 2, which is the perceived ease of use construct, are shown in Table 4 below.

Table 4
User responses about the ease of use of the VCMS system

The construct of perceived ease of use (PEU)	Mean
1. For me, learning how to use the VCMS system was very easy.	4.348
2. I find it very easy to get what I want through VCMS system.	4.238
3. It is very easy for me to master the VCMS system.	4.308
4. I found the VCMS system to be very easy to use.	4.321
5. I find that the VCMS system is very flexible to use.	4.148
Average mean	4.272

Based on the findings of the perceived usefulness construct (PEU), it was found that the mean average value was 4.272. The average value of this mean is also above 4,000 which means that the feedback from the respondents is very positive. This proves that the VCMS system is certified for ease of use by the lecturers.

3.1 Findings of Part 3

3.1.1 Structured open questionnaire

Q1 - In your opinion, is this VCMS system suitable for use in the evaluation and assessment system at KV?

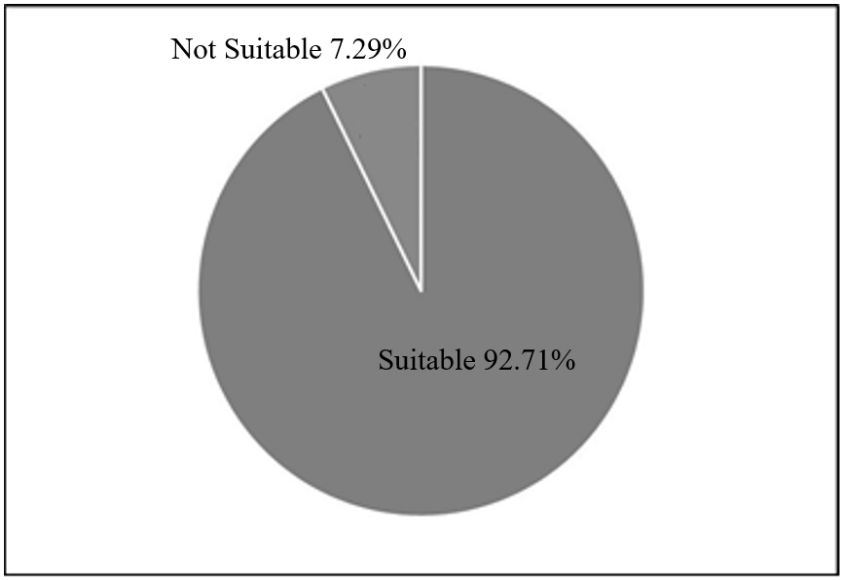

Fig. 3. User response about the suitability of using the VCMS system

Based on the findings shown in Figure 3 above, the majority of users i.e. 92.71% stated that this VCMS system is suitable for use in evaluation and assessment in KVs that have used it.

Q2 - In your view, what are the main factors that cause lecturers not to be interested in using the VCMS system?

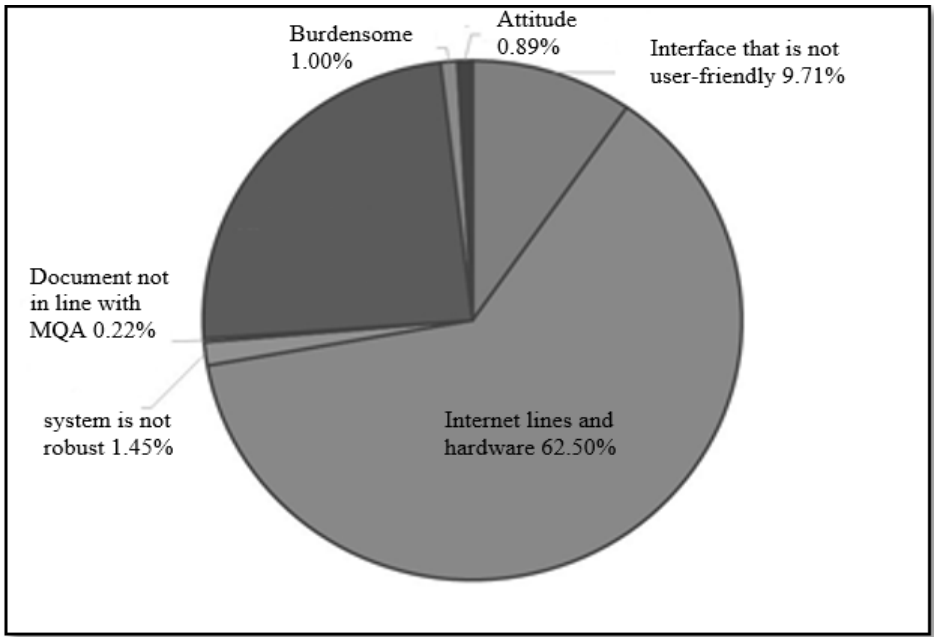

Fig. 4. Factors that cause users not to be interested in using the VCMS system

Based on the findings shown in Figure 4 above, the main factor that causes lecturers to be disinterested in using the VCMS system is problems related to infrastructure, namely internet lines and hardware which shows 62.50%. The factor of lack of training or exposure about the VCMS system is the second factor that contributes to this issue with a response of 24.22%. In addition, there are other factors such as an interface that is not user-friendly, the system is not robust, burdensome, and the documents in the system are not in line with the requirements of the Malaysian Qualifications Agency (MQA).

Q3 - In your view, what improvements are suggested to encourage the use of the VCMS system among lecturers at KV?

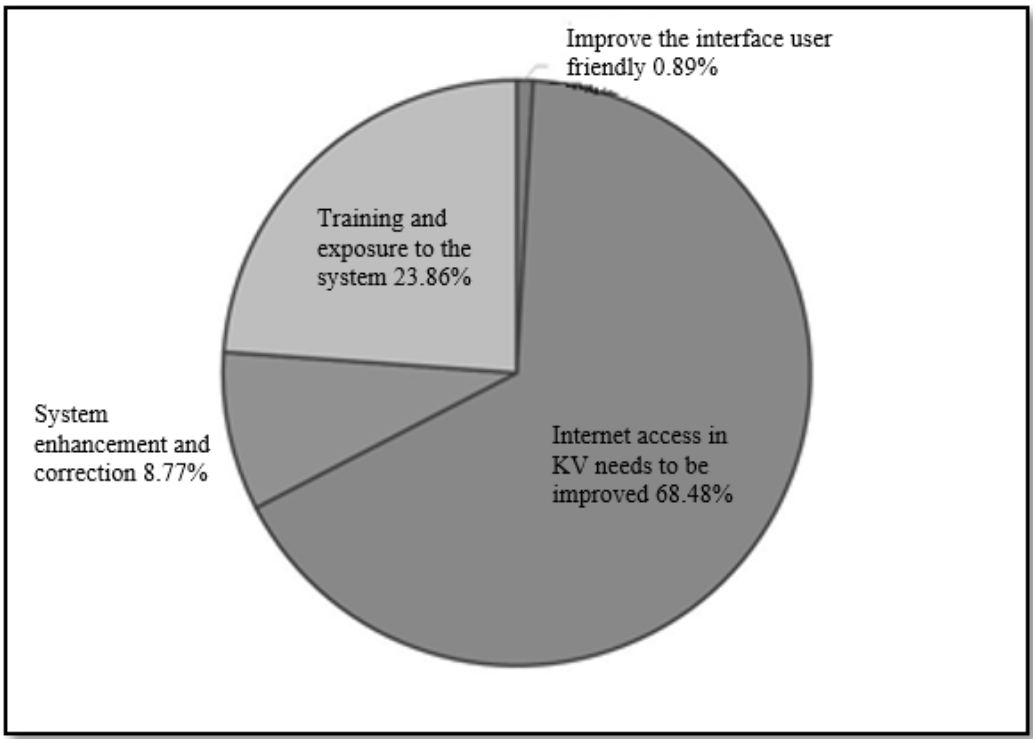

Fig. 5. Suggested improvements to promote the use of the VCMS system

Based on the findings shown in Figure 5 above, 66.48% of respondents suggested that internet access in KV needs to be improved in addition to upgrading hardware such as system servers. Meanwhile, 23.86% suggested that training and exposure to the system should also be carried out periodically. Another suggestion that was also made was to strengthen the system and improve the interface to be more user-friendly.

4. Conclusion

Based on the findings of this needs analysis study, it generally shows that the VCMS system developed by KV Pasir Mas is very useful and easy to use. However, the researcher found that there is an obstacle from the aspect of technology readiness, which is that there are several factors that cause VCMS users to be less interested in using it. The main factor is from the aspect of infrastructure and the aspect of training, apart from some other factors. These two main aspects are identified as factors that cause delays in the implementation of the VCMS system. Technology readiness (TRI) refers to a person's tendency to master and use new technology to achieve goals in a job. Therefore,

the researcher thinks that there is a need for a study extension to see this problem in more depth based on the Technology Readiness Index TRI model introduced by a previous study. Technology readiness behavior is strongly influenced by four constructs in TRI, namely optimism (optimism), innovativeness (innovativeness), discomfort (discomfort) and anxiety (insecurity).

Acknowledgement
This research was not funded by any grant.

References

[1] Arifin, S., and M. Sukmawidjaya. "Technology transformation and its impact on lecturer's performance." *JPI (Jurnal Pendidikan Indonesia)* 9, no. 1 (2020): 153-162. https://doi.org/10.23887/jpi- undiksha.v9i1.24372
[2] Davis, Fred D. "Perceived usefulness, perceived ease of use, and user acceptance of information technology." *MIS quarterly* (1989): 319-340.
[3] Hossain, Md Anwar, Md Abdus Salam, Faijunnassa Shilpi, and Assistant Documentation Officer. "Readiness and challenges of using Information and Communications Technology (ICT) in higher education of Bangladesh." *The Online Journal of New Horizons in Education* 6, no. 1 (2016): 123-132.
[4] Kementerian Pendidikan Malaysia. Pelan Pembangunan Pendidikan Malaysia 2013-2025: Pendidikan Pra sekolah hingga Lepas Menengah. Putrajaya: Kementerian Pendidikan Malaysia. (2013).
[5] Mustapha, R. "Acceptance of iTEMS as a MIS in examination and evaluation system". 2019.
[6] Lee, Gwo-Guang, and Hsiu-Fen Lin. "Customer perceptions of e-service quality in online shopping." *International journal of retail & distribution management* 33, no. 2 (2005): 161-176. https://doi.org/10.1108/09590550510581485
[7] Mosa, Asma Ali, Mohd. Naz'ri bin Mahrin, and Roslina Ibrrahim. "Technological Aspects of E-Learning Readiness in Higher Education: A Review of the Literature." *Comput. Inf. Sci.* 9, no. 1 (2016): 113-127. https://doi.org/10.5539/cis.v9n1p113
[8] Nugroho, Mahendra Adhi, and M. Andryzal Fajar. "Effects of technology readiness towards acceptance of mandatory web-based attendance system." *Procedia Computer Science* 124 (2017): 319-328. https://doi.org/10.1016/j.procs.2017.12.161
[9] Panday, Rorim. "The effect of technology readiness on technology acceptance in using services delivery of academic information system." (2018).
[10] Panday, Rorim, and John Tampil Purba. "Lecturers and students technology readiness in implementing services delivery of academic information system in higher education institution: A case study." In *Intelligence in the Era of Big Data: 4th International Conference on Soft Computing, Intelligent Systems, and Information Technology, ICSIIT 2015, Bali, Indonesia, March 11-14, 2015. Proceedings 4*, pp. 539-550. Springer Berlin Heidelberg, 2015. https://doi.org/10.1007/978-3-662-46742-8
[11] Parasuraman, Ananthanarayanan. "Technology Readiness Index (TRI) a multiple-item scale to measure readiness to embrace new technologies." *Journal of service research* 2, no. 4 (2000): 307-320.
[12] Suki, Norazah Mohd, and Thurasamy Ramayah. "User acceptance of the e-government services in Malaysia: structural equation modelling approach." *Interdisciplinary Journal of Information, Knowledge, and Management* 5 (2010): 395. https://doi.org/10.28945/1308