

IDENTIFYING LECTURER'S VIRTUAL LEARNING COMPETENCIES DURING COVID-19: IMPORTANCE-PERFORMANCE MATRIX ANALYSIS (IPMA)

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ABSTRACT

The COVID-19 pandemic has had a significant impact on Malaysia education landscape, accelerating the digitisation of higher education. The widespread disruption not only affects the students but also lecturers as they have to prepare their teaching and learning material to a virtual method in order to continue their daily teaching activities. In addition to evaluating lecturers' competencies on virtual learning, the survey also aims to identify areas for improvement. PLS-SEM is used to do an Importance-Performance Matrix Analysis (IPMA) to identify the key pillars that influence lecturer readiness for virtual learning. For the IPMA, a two-dimensional grid, each benefit is divided down into four categories: (1) concentrate here; (2) keep up the good work; (3) low priority; and (4) possible overkill. Using this tool, management can immediately identify the attributes that are performing well and those that need to be improved, which necessitate action. The findings can be used to help educators to improve their digital readiness in teaching.

Keywords: Lecturer, Acceptance, Online learning, COVID-19, IPMA.

INTRODUCTION

Within a very short period, the onslaught of the COVID-19 pandemic has transformed almost all segments of society. The world is still fighting over the unresolved different variants of COVID-19 which are forcing many universities across the world to maintain providing their educational services through virtual learning. In China, the universities encourage their professors to continue with virtual learning for the indefinite future, showing that virtual learning is here to stay (Huili, 2020). The United Nation's scientific and cultural organisations also recommended the education services to use diverse technologies to ensure the continuity of teaching and learning despite the difficulties caused by the pandemic outbreak (Sufian, Nordin, Tauji, & Nasir, 2020). The sudden transition toward virtual learning affects universities especially from underdeveloped countries (Almahasees, Mohsen, & Amin, 2021). During this pandemic crisis, some institutions have been practising online education on certain subjects or courses using commercial or freeware tools. Most institutions were also ready to adopt online education to ensure continuity of their institutions. Nevertheless, for the universities that are inadequately equipped to teach virtually, this affect their day-to-day teaching and learning process as the lecturer are inexperienced to conduct virtual learning courses (Almahasees et al., 2021).

In response to the COVID-19 crisis, some institutions and faculty had previously adopted online education and had been comfortable with it; many others, however, had only recently begun utilising it and only now beginning to experience the benefits and challenges that come with it. Institutions encountered various challenges during the transition toward online environment. These included helping lecturer to prepare themselves with this teaching methods by training and advising them to use better technologies such as WebEx or Zoom or create a narrated PowerPoint presentation. Despite the lecturers being unfamiliar with some of these teaching tools, most universities insist to push on the transition to online education mode overnight, with little or no preparation. Thus, it is important to evaluate the lecturer's competencies on virtual learning during the COVID-19 pandemic.

This paper is structured as follows; a literature review is demonstrated in the next section. It is then followed by research methodology which is explained in the third section. Next will be findings while discussions and the conclusion are elaborated in the last section.

LITERATURE REVIEW

Virtual Learning Competencies

Virtual learning is a system that allows students to participate in class just like a traditional classroom except students have to use a computer and internet connection to ask questions and receive feedback from the lecturers (Anekwe, 2017). Hence, by using virtual learning, universities are able to provide limitless teaching and learning services to every student, inside, and outside Malaysia (Mohd Salleh & Nik Azman, 2020). According to the International Board of Standards for Training, Performance, and Instruction, competency is defined as knowledge, skill or attitude that allows a person to effectively perform the activities or tasks to achieve the employer's expectation (Beaudoin, Kurtz, Jung, Suzuki, & Grabowski, 2013). Lecturers are playing an important role to build a positive environment during the teaching and learning process in virtual learning (Guasch et al., 2010). They also design and plan the courses. Thus, it is imperative for the lecturers to have the necessary knowledge and skills to present the right content and facilitate a virtual learning environment (Junus, Santoso, Putra, Gandhi, & Siswantining, 2021). In this study, based on the previous literature, we examine three areas of online teaching competencies: 1) course communication development, 2) course design development, 3) and time management.

Course Communication Development

Virtual learning lacks a physical environment. Previous studies identified various disadvantages of virtual learning when it comes to communication for example physical separation, reduced sense of community, disconnectedness, isolation, distraction, and lack of personal attention (Besser and Donahue, 1996; Kerka, 1996; Tinto, 1993; Twigg, 1997). Therefore, communication is one of the vital parts of virtual learning (Mohd Salleh & Nik Azman, 2020). According to Goodyear et al. (2001), students' and lecturers' interpersonal communication and interaction is a must. Feedbacks should be timely and prompt to sustain students' interest in the study (Carr, 2000).

Course Design Development

Virtual learning requires a different course design than conventional face to face courses. According to Junus et al. (2021), lecturers need to revise the content, delivery methods, and other course design attributes. The main challenge is to ensure the students are able to accept the new learning style (Martins & Kellermanns, 2004; Van Raaij & Schepers, 2008). Designing a virtual learning course requires meticulous planning (Mohd Salleh, Wan Hanafi, & Nik Azman, 2020). Previous researchers recommend that virtual learning course design should be able to assist students to achieve their desired knowledge results (Baldwin & Trespalacios, 2017).

Time Management

Virtual learning consumes time as the lecturers need to redesign the course objectives, content, activities, and assessment (Martin, Budhrani, & Wang, 2019). Lecturers also spend their private time helping struggling students and even helping them with technical difficulties (Napier et al., 2011). Although previous studies believe that ability to manage time is important for effective virtual learning, a lecturer is burdened with extra tasks to monitor students and maintain proper records and gradebooks (Aydin, 2005; Coppola et al., 2002; Darabi et al., 2006; Varvel, 2007).

Hypothesis Development

According to Vanhorn, Pearson, and Child (2008), lecturers need to be more optimistic in communicating with the students despite the possibility of student disengagement during class. Furthermore, lecturers need to use various methods in order to formulate positive responses from the students (Varvel, 2007). However, due to the unexpected pandemic breakout, most lecturers host virtual classes with low practicability and without a strategic solution for effective communication (Junus et al., 2021). Thus, this hypothesis has been proposed:

Hypothesis 1: There is a significant relationship between course communication development and virtual learning competencies.

A previous study stated that course design development should include student-lecturer engagement as it is important to reduce the distance between lecturers and students in virtual learning (Beldarrain, 2006). According to Ko and Rossen (2001), well-designed courses are able to encourage students to do well in their studies. However, Junus et al. (2021) found that lecturers are not optimistic as they did not believe that the virtual learning course outcome could be achieved as the transitions toward virtual learning are too drastic. Therefore, this hypothesis has been proposed:

Hypothesis 2: There is a significant relationship between course design development and virtual learning competencies.

A previous study found that time management on virtual learning depends on the lecturer's experience and university support (Visser, 2000). Junus et al. (2021) found that lecturers consumed more time to record videos, upload course materials, monitor students' activities, and review assignments. Additionally, lecturers also need further time to assess student achievement. Hence, this hypothesis has been proposed:

Hypothesis 3: There is a significant relationship between time management and virtual learning competencies.

RESEARCH METHOD

This research adopted an explanatory research design with the survey as the primary data collection technique. The collected data was cross-sectional data, through online distribution of the questionnaire. The selection of the research design was based on the nature of the research objectives that required hypothesis testing and the requirement to observe the occurrence in its natural setting. Data were acquired through a structured questionnaire survey. The questionnaire was modified from prior studies that showed excellent internal consistency.

Measurements

The survey was conducted using a questionnaire based on the literature. An English-language questionnaire was developed and administered. There were two sections to a survey questionnaire. The respondents' demographics were gathered in the first section of the survey. Course design communication and time management were measured in the second section of the survey based on the work done by Martin et al. (2019). On a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree), each item was evaluated.

Respondent Profile

A total of 500 questionnaires were emailed to the selected respondents, however, only 221 of these were returned. Females make up the majority of the 221 responders (147 responders). In terms of age, those between the ages of 31 and 35 had the biggest number of respondents (86 respondents). The majority of respondents were lecturers, and their study delivery mode was

synchronous. The majority of those who responded were professors in undergraduate subjects (197 respondents). Finally, when it comes to work experience, the biggest number of respondents (170) were respondents who had 6 to 10 years of experience.

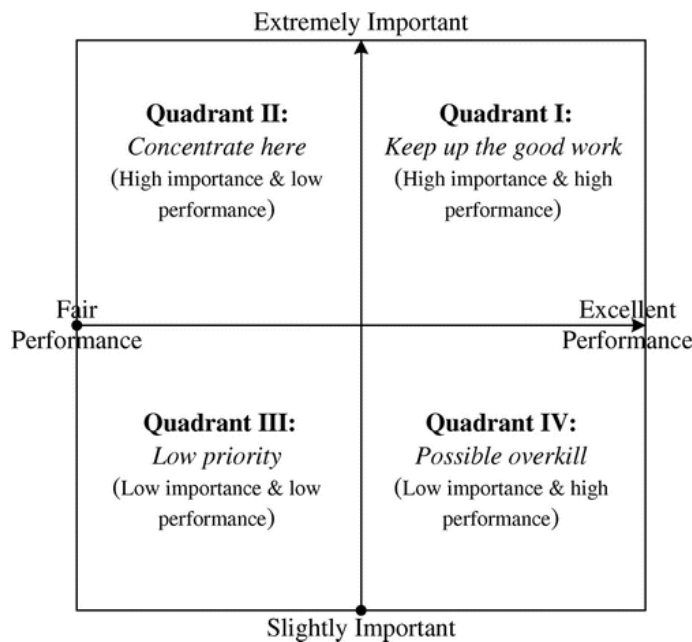
Data Analysis

This study applied Partial Least Square-Structural Equations Modelling (PLS-SEM) to test the hypothesised research model empirically. This methodology allows the assessment of the reliability and validity of the measuring items (i.e. indicators), constructs (i.e. latent variables), and the complex relationships between them (Hair, Matthews, Matthews, & Sarstedt, 2017; Hair, Risher, Sarstedt, & Ringle, 2019). SmartPLS 3.2.9 software was used to test the validity and statistical significance of the measurement model, structural model, and the Importance-Performance Matrix Analysis (IPMA) (Hair et al., 2019).

Martilla and James (1977) developed and produced Importance-Performance Matrix Analysis (IPMA) to quantify client satisfaction with a product or service. The IPMA method emphasises that client happiness is a result of both the importance of a product or service and the company’s performance in providing it (Martilla & James, 1977). It assesses not only an item’s performance but also its value in determining the respondent’s satisfaction (Silva & Fernandes, 2011). The sum of those two components provides a clear picture of client satisfaction and where agency resources should be focused.

Graphically, the importance and performance data were plotted on a pair of coordinate axes, where ‘importance’ was displayed along the Y-axis and ‘performance’ was displayed along the X-axis. Then, the data were mapped into four quadrants (Martilla & James, 1977), as shown in Figure 1. Each quadrant shows the rating of importance and performance of an element of the service assigned by customers.

Figure 1: Importance-performance map
Source: Martilla and James (1977)



FINDINGS

The interpretation of the PLS model comprises two phases: measurement model (outer model) analysis and structural model (inner model) analysis. The Importance-Performance Matrix Analysis (IPMA) was carried out to map the impact of the indicators and constructs on the dependent variable.

Measurement Model

The estimation of the measurement model is satisfactory. Table 1 shows that outer loadings are higher than 0.707. This means that all indicators are suitable (Hair et al., 2019). Furthermore, the construct reliability requirement is adequate because Cronbach’s alpha, rho A, and composite reliability values are higher than 0.600 for all the reflective constructs. The convergent validity criterion was met as the average variance extracted (AVE) values are greater than 0.500. Finally, all the variables exhibit discriminant validity, since all the HTMT values are below 0.85 (Kline, 2015).

Table 1: Reliability and Validity Analysis

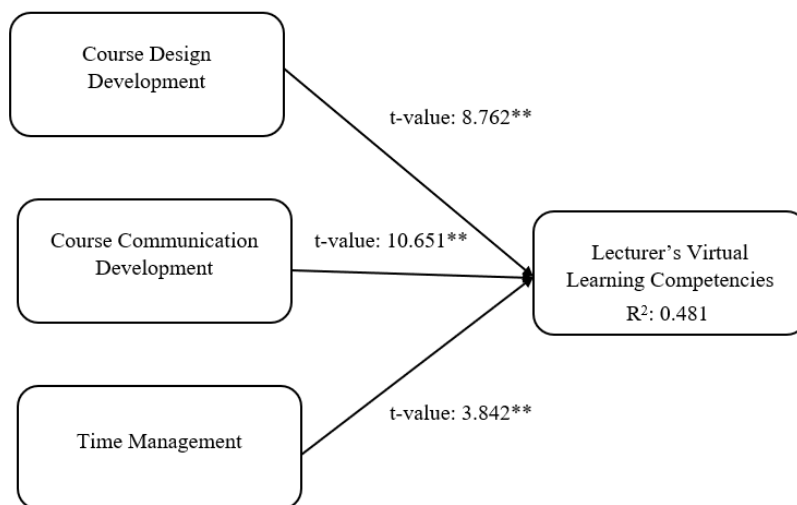
Variable	Indicators	Loadings	Indicator Reliability	CR	AVE	Maximum HTMT ^a	Discriminant Validity
Course Design Development	CDD1	0.717	0.654	0.756	0.588	0.603	Yes
	CDD2	0.687					
	CDD3	0.635					
	CDD4	Deleted					
	CDD5	0.614					
	CDD6	Deleted					
	CDD7	Deleted					
	CDD8	Deleted					
	CDD9	Deleted					
Course Communication Development	CCD1	0.668	0.738	0.806	0.510	0.389	Yes
	CCD2	Deleted					
	CCD3	Deleted					
	CCD4	Deleted					
	CCD5	0.653					
	CCD6	0.603					
	CCD7	0.772					
	CCD8	0.771					
	CCD9	0.685					
	CCD10	Deleted					
	CCD11	Deleted					
	CCD12	Deleted					
Time Management	TM1	0.647	0.728	0.769	0.584	0.292	Yes
	TM2	0.910					
	TM3	0.697					
	TM4	Deleted					
	TM5	0.649					
	TM6	Deleted					

Note: CR= Composite Reliability, AVE = Average Variance Extracted, ^aHeteroTrait-MonoTrait ratio of correlations for discriminant validity

Structural Model

As to the assessment of the structural model, Hair et al. (2019) stated that the use of bootstrapping (5000 resamples) produces standard errors and confidence intervals to assess the statistical significance of the path coefficients (Hair et al., 2019). All the path coefficients in Figure 2 were significant. Our model provided a coefficient of determination (R^2) of 0.481 for the lecturer’s virtual learning competencies. The R^2 value of 0.481 was above the 0.26 value as suggested by Chin (1998), which indicates a substantial model.

Figure 2: Research Model



Importance-Performance Matrix Analysis (IPMA)

The Importance-Performance Matrix Analysis (IPMA) has been performed in this study. Variables with high importance and low performance can be easily identified by assessing IPMA (Höck, Ringle, & Sarstedt, 2011). Correspondingly, the outcomes from IPMA analysis will contribute to insights for company’s owners to overcome and improve on identified areas with low performance

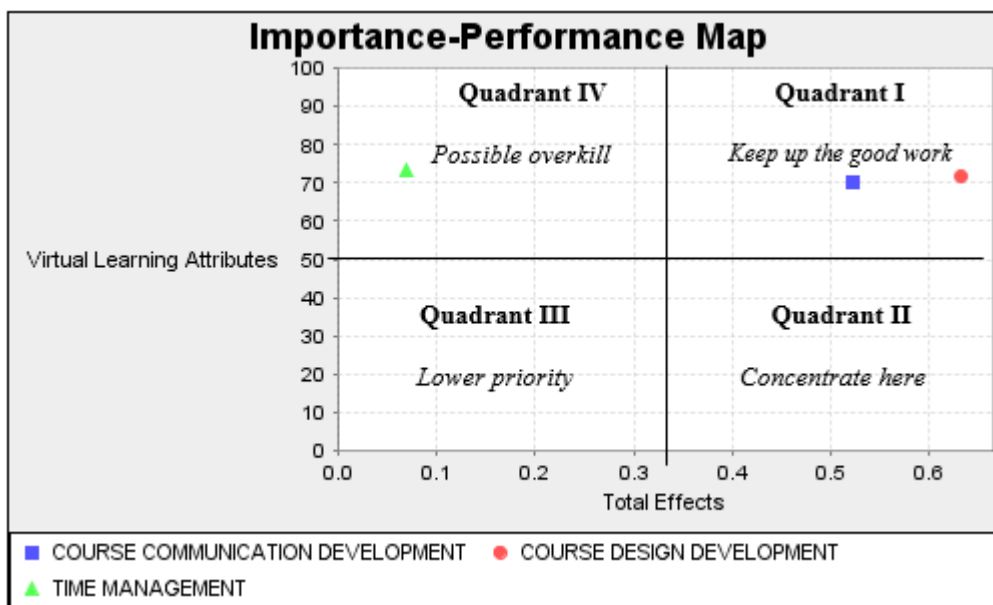
and high importance (Höck et al., 2011). The importance value is the direct effect of an exogenous variable on an endogenous variable, whereas the performance value is the latent variable score on a scale from 0 to 100 (Refer Table 2). Time management has the highest performance, but it was the least important factor. The IPMA map also shows that course design development is equally an important factor as course design communication.

Next, the index values and total effects scores were plotted out in a priority map as shown in Figure 3 below. All the three dimensions can also be mapped based on four quadrants which are quadrant I (keep up the good work), quadrant II (concentrate here), quadrant III (lower priority), and quadrant IV (possible overkill). From the three dimensions, one dimension is in the concentrate here quadrant (time management). This shows that when it comes to pursuing online education, time management is everything. Management should help lecturers in managing this aspect by providing training related to time management.

Table 2: IPMA Results

Variables	Lecturer's Virtual Learning Competencies	
	Total Effect	Index Value (Performance)
Course Design Development	0.523	70.189
Course Design Communication	0.632	71.756
Time Management	0.069	73.286

Figure 3: Importance-Performance Matrix Analysis (IPMA)



DISCUSSION AND CONCLUSION

This study aims to identify the lecturer’s virtual learning competencies. Online and face-to-face learning require different skills. Competency can be defined as observable behaviours or skill sets, performance standards or quality, or dimensions of knowledge, skills, and abilities (Al-Salman, 2011). The literature has classified online teaching competencies at various levels and using various methodologies. Building from past literature, this study examines three areas of virtual learning teaching competencies which are course design, communication, and time management. To verify the reliability and validity of the items used, structural equations analysis was performed using the Partial Least Square-Structural Equations Modelling (PLS-SEM) statistical software. The model adequately fitted the data which gained support for the proposed theoretical model.

Other than that, IPMA can help to identify areas of concern and hence help to bridge the gap between the importance and performance of qualities. Concentrate here, keep up the good work, low priority, and possible overkill are all examples of quadrants. Priority should be given to those characteristics that fall within the 'concentrate here' quadrant for improvement. Where in this study, the focus should be given to time management. Despite the benefits of online learning able to produce young generation with better learning, life and literacy skills, some issues can hinder the effectiveness of online learning. One of the main issues that affect online learners is poor time management. Lack of schedule, too many distractions and multitasking can lead to poor time management.

Theoretically, this study also extends the body of knowledge in the area of virtual learning competencies. Recommendation from the current study is to conduct future research with larger samples of lecturers. Other than that, future research in this field of study would necessitate a more in-depth review, as well as empirical research on these variables (course communication development,

course communication design, and time management). Practical recommendation for the management in improving lecturer time management is by providing them with some sought of training about the management of time. Lecturers should also insist to plan their lessons in advance. Besides that, competition and appreciation methods should also be used to motivate the lecturers to plan their lessons to save time.

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REFERENCES

- Almahasees, Z., Mohsen, K., & Amin, M.O. (2021) Faculty's and Students' Perceptions of Online Learning During COVID-19. *Front. Educ.*, 6:638470. doi: 10.3389/educ.2021.638470
- Al-Salman, S. M. (2011). Faculty in online learning programs: Competencies and barriers to success. *Journal of Applied Learning Technology*, 1(4), 6-13.
- Anekwe, J.U. (2017). Impacts of Virtual Classroom Learning on Students of Nigerian Federal and State Universities. *European Journal of Research and Reflection in Educational Sciences*, 5 (3), 21- 34
- Aydin, C. H. (2005). Turkish mentors' perception of roles, competencies, and resources for online teaching. *Turkish Online Journal of Distance Education*, 6(3), 1–23.
- Baldwin, S. J. & Trespalacios, J. (2017). Evaluation Instruments and Good Practices in Online Education. *Online Learning*, 21(2).
- Beaudoin, M., Kurtz, G., Jung, I., Suzuki, K. & Grabowski, B.L. (2013). *Online Learner Competencies: Knowledge, Skills, and Attitudes for Successful Learning in Online Settings*. IAP: Charlotte, NA, USA, 2013; ISBN 1623964024
- Beldarrain, Y. (2006). Distance education trends: Integrating new technologies to foster student interaction and collaboration. *Distance Education*, 27(2), 139–153.
- Besser, H. & Donahue, S. (1996). Introduction and overview: perspectives on distance independent education. *Journal of American Society for Information Science*, 47 (11), 801-804.
- Carr, S. (2000). Distance education comes of age, the challenge is keeping the students. *The Chronicle of Higher Education*, 46 (23), A39-A41.
- Chin, W. W. (1998). The partial least squares approach to structural equation modeling. *Modern methods for business research*, 295(2), 295-336.
- Coppola, N. W., Hiltz, S. R., & Rotter, N. G. (2002). Becoming a virtual professor: Pedagogical roles and asynchronous learning networks. *Journal of Management Information Systems*, 18(4), 169–189. <https://doi.org/10.1080/07421222.2002.11045703>
- Darabi, A. A., Sikorski, E. G., & Harvey, R. B. (2006). Validated competencies for distance teaching. *Distance Education*, 27(1), 105–122.
- Guasch, T., Alvarez, I. & Espasa, A. (2010). University teacher competencies in a virtual teaching/learning environment: Analysis of a teacher training experience. *Teach. Teach. Educ.*, 26, 199–206.
- Hair, J.F., Matthews, L., Matthews, R., & Sarstedt, M. (2017). PLS-SEM or CB-SEM: updated guidelines on which method to use. *International Journal of Multivariate Data Analysis*, 1(2), 107-123.
- Hair, J.F., Risher, J.J., Sarstedt, M., & Ringle, C.M. (2019). When to use and how to report the results of PLS-SEM. *European Business Review*.
- Höck, C., Ringle, C. M., & Sarstedt, M. (2011). Management of Multi-Purpose Stadiums: Importance and Performance Measurement of Service Interfaces. *International Journal of Services Technology and Management*, 14(2/3), 188-207.
- Huili, H. (2020). How to make the switch to online teaching more effective.
- Junus, K., Santoso, H.B., Putra, P.O.H., Gandhi, A. & Siswantining, T. (2021). Lecturer Readiness for Online Classes during the Pandemic: A Survey Research. *Educ. Sci.*, 11, 139. <https://doi.org/10.3390/educsci11030139>
- Kamarudin, M. H., Yunus, N. K. Y., & Razali, T. R. A. T. (2020). Pengaruh penerimaan teknologi dan budaya organisasi terhadap aplikasi iBestarinet. *Jurnal Dedikasi*, 14, 181–218. <http://myjms.moe.gov.my/index.php/jd/article/view/7984/3370>
- Kerka, S. (1996). Distance learning, the Internet, and the World Wide Web. *ERIC Digest*, ERIC Document Reproduction Service No ED 395 214, The Ohio State University.
- Kline, R. B. (2015). *Principles and practice of structural equation modeling*: Guilford publications.
- Ko, S. & Rossen, S. (2017). *Teaching online: A practical guide*. Oxon: Routledge.
- Martilla, J. A., & James, J. C. (1977). Importance-performance analysis. *Journal of marketing*, 41(1), 77-79.
- Martin, F., Budhrani, K., & Wang, C. (2019). Examining faculty perception of their readiness to teach online. *Online Learning Journal*, 23(3), 97–119 <https://doi.org/10.24059/olj.v23i3.1555>
- Martins, L. & Kellermanns, F. (2004). Student Acceptance of a web-based course management system. *Academy of Management Learning and Education*, 3, 7-26. 10.5465/AMLE.2004.12436815.
- Mohd Salleh, S. & Nik Azman, N.A. (2020). Lecturer POV: Moving Toward Virtual Learning. *Global Business and Management Research: An International Journal*, 12 (4).
- Mohd Salleh, S., Wan Hanafi, W.N. & Nik Azman, N.A. (2020). *Lecturers' perception of online learning during COVID19: A study among Government Link Universities (GLUs)*. Paper presented at 6th Asia International Conference 2020 (AIC 2020).
- Silva, F. H., & Fernandes, P. O. (2011). *Importance-performance analysis as a tool in evaluating higher education service quality: the empirical results of ESTiG (IPB)*. Paper presented at the 17th International Business Information Management Association Conference.

- Sufian, S. A., Nordin, N. A., Tauji, S. S. N. & Nasir, M. K. M. (2020). The Impact of Covid-19 on the Malaysian Education System. *International Journal of Academic Research in Progressive Education & Development*, 9(2), 764-774.
- Tinto, V. (1993). *Leaving College: Rethinking the Causes and Cures of Student Attrition*, 2d ed. University of Chicago Press, Chicago, IL.
- Twigg, C.A. (1997). Is technology a silver bullet?. *Educom Review*, 31 (2), 28-29.
- Vanhorn, S., Pearson, J.C. & Child, J. (2008). The Online Communication Course: The Challenges, Qualitative Research Reports in *Communication*, 9:1, 29-36, DOI: 10.1080/17459430802400332
- Van Raaij, E. & Schepers, J. (2008). The acceptance and use of virtual learning environment in China. *Computers & Education*, 50, 838-852. 10.1016/j.compedu.2006.09.001.
- Varvel, V. E. (2007). Master online teacher competencies. *Online Journal of Distance Learning Administration*, 10(1), 1-41.
- Visser, J. A. (2000). Faculty work in developing and teaching web-based distance courses: A case study of time and effort. *American Journal of Distance Education*, 14(3), 21-32. doi:10.1080/0892364000952

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