

Determining the effectiveness of pre-university student's online learning in Geography subject using relative importance index

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AbstrAct

This study aims to examine the Relative Importance Index (RII) that influences online learning in the subject of Geography. The study adopted survey research design involving five secondary schools in the state of Perak, Malaysia consisted of 135 preuniversity students selected via simple random sampling method. Data were collected through a questionnaire developed by the researchers. The questionnaire was composed of 45 items to measure interest, acceptance, and effectiveness. The collected data were analyzed via SPSS software using descriptive analysis and RII analysis. Findings of the study revealed that the statement; 'when learning there is an interesting video display' had the highest RII value (RII = 0.8933), while 'I prefer to learn through the internet because any time I can learn' received the second highest RII value (RII = 0.8296) for the factor acceptance criteria. For the learning effectiveness criteria, the 'online learning factor created curiosity to me in the subject of Geography' had the highest RII value (RII = 0.8281). Finally, for the achievement criteria, the factor of 'understanding the important contents in learning through attractive colors and graphics contributes the highest RII value (RII = 0.8207). On average, the RII value of the interest criterion was in the highest position (RII = 0.8076), followed by the achievement criterion (RII = 0.7684). Meanwhile, the learning effectiveness criteria were in the lowest position (RII = 0.7516) of the overall study criteria. The conclusion from this study shows that the criteria of interest and achievement are the main factors of online learning choices of pre-university Geography students.

Keywords: Acceptance, effectiveness and achievement, geography, interest, Relative Importance Index (RII), online learning,.

Introduction

The current COVID-19 pandemic has altered human life patterns. The Movement Control Order (MCO) has now restricted all community activities. Schools and institutes of higher learning (IHE) are also conducted entirely online in terms of learning implementation. During the MCO period, the Ministry of Education Malaysia (MOE) circulated a teaching and learning (T&L) implementation guide that includes online learning using Microsoft Teams, Facebook Live, and Google Classroom beginning on 1 April 2020 to ensure that students do not miss out on education (Fazurawati, 2020). These lifelong learning skills are among the most important 21st-century skills that every individual must master to succeed in this challenging century.

Today's technological advancements have impacted the education sector, significantly altering the current pattern of teaching and learning following 21st Century Learning (PAK-

21). The 2015–2025 Malaysian Higher Education Development Plan (MHEDP) also emphasizes the use of information technology and the transformation of the teaching and learning processes and delivery. This plan establishes the ninth surge, namely the global level of online learning, to transform the education system by utilizing information technology to improve learning quality in Malaysia (Norfarahi et al., 2020). Online learning can be used to compensate for the shortcomings of traditional learning while also enhancing student interest and achievement. Online learning is commonly referred to as student-centered learning facilitated by information technology, communication, and multimedia (Faizatul Hafilah & Nor Syahilia, 2010). The future

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of online learning for the Malaysian higher education system is centered on global quality standards, increased access, and equity, ensuring that disadvantaged groups can fully benefit from it (Norfadzilah, 2016). Still, how far can this method of instruction be taken in Geography at the pre-university level? Such a subject contains dynamic elements of science, particularly in Physical Geography (Pablo et al., 2019), which can cause students to become bored if the teaching techniques and strategies fail to capture students' attention (Shamsiah & Azman, 2015). Traditional teaching techniques and methods, such as blackboards and lecture teaching, are insufficient for enticing students to master the subject (Abdul Said et al., 2011). The teaching of Geography, as in the subject's information, should be conveyed to students effectively and clearly, and students should be taught how and where to obtain such information using available technology (Kocalar & Demikaya, 2017). Online learning can result in meaningful learning while also increasing students' motivation and knowledge, such as thinking creatively, innovatively, and constructively, building new knowledge, and solving real-world problems (Yusup et al., 2013). Therefore, technology is important in geography learning such as were used in Geographic information technology uses computer-based tools to analyze spatial information into a geographic information system (GIS). In a GIS, data of the real world are stored into a georeferenced database, which can be displayed via maps.

Since 2013, the subject of Geography at the Malaysian Higher School Certificate level (Sijil Tinggi Pelajaran Malaysia-STPM) has emphasized spatial relationships while also promoting problem-solving and critical thinking, collaborative learning strategies, the use of technology, and observation through field studies in Malaysia (Mohammad Zohir, 2016). Nonetheless, what occurs in schools is that teachers and students perceive technology or online learning to be underutilized in the teaching and learning process due to numerous constraints and challenges (Shahfiezul & Fariza, 2015). Furthermore, most teachers do not use computers in the classroom due to a phobia or fear of computers, as well as

a reluctance to use them in teaching and learning (Nor Zaira et al., 2016). However, online learning necessitates teaching reference materials, which are contingent upon teachers' mastery of and proficiency with computers (Norazlina & Abdul, 2013). These issues have hampered the government's efforts to integrate information and communication technology into the T&L process in schools to keep up with the current technological boom (Faizah, 2017) and current developments that incorporate home teaching and learning. This study, which was implemented earlier in 2019, aims to analyze the criteria position for the effectiveness of online learning in the subject of Geography at the preuniversity level using the Index of Relative Importance (RII).

Literature Review

Interest is defined as a person's proclivity to approach, or desire to look at, an object. It is critical in assisting a student to achieve success in the world of education. The level of interest exhibited by a student affects the learning process (Mohd Faizal, 2012). Moreover, Slameto (2003) discusses this concept, stating that interest is the students' natural attraction to a thing or activity. The lecturer or instructor's teaching style should vary according to the current circulation and generation taught to capture their interest as the era changes. According to Che Ghani and colleagues (2016), if a lecturer or instructor does not adapt his/her teaching to students' learning styles, students will experience discomfort and a lack of attention during teaching and learning sessions, which will result in them falling behind in lessons. Based on Felder and Silverman's (1998) study, students' learning styles vary; hence, online learning is one of the alternative methods in the teaching and learning process.

As discussed by Rian and Osman (2013), using an online learning system can improve the effectiveness and efficiency of the learning process when compared to the use of conventional systems. This is because online learning benefits all parties involved in the teaching and learning process and also facilitates student communication. Furthermore, it motivates students to learn, which has a positive effect on academic achievement. Incorporating media into the educational process will further enhance students' comprehension and diversify learning activities (Norah et al., 2013). Students' learning has been aided by the use of videos in a variety of ways. A video is defined as a medium that displays both audio and graphics at the same time (Shephard, 2003). While it is essentially the same as television, the concept has evolved over the last six decades (Smaldino et al., 2008). Learning videos are a type of media that educators can utilize to assist them in the T&L process. According to Norah et al. (2013), although video media production used to be prohibitively expensive, educators can now create their own videos based on their ideas and creativity.

Moreover, students cannot avoid encountering difficulties and obstacles when utilizing online learning. According to Muhammad Sukri and colleagues (2007), the acceptance of online learning is influenced by the barriers associated with online learning features that are less appealing, less friendly, and less interactive, causing students to feel more at ease connecting with lecturers and friends via Facebook, Whatapps, Wechat, and Email. Additionally, Waheed and Hussain (2010) assert that lecturer characteristics can

contribute to the acceptance of online learning and provide students with greater satisfaction.

Teachers will inevitably face significant constraints and challenges to provide a 21st Century Learning (PAK21) environment for students, as many 21st-century skills must be applied in a minimal amount of instructional time (Masyuniza, 2015). Attempts to instil 21st-century skills

in students are deemed challenging due to their diverse educational backgrounds, levels of knowledge, and learning styles. Thus, teachers must play a critical role in implementing various PdPc techniques to generate meaningful learning while retaining students' seriousness and motivation for learning (Iberahim et al., 2017). The effectiveness of students' ability to master both the learning content and the required skills is affected by the use of appropriate teaching approaches. Utilizing novel teaching methods and approaches combined with creative planning can help students better understand the subject material (Nurul Nashrah et al., 2015).

The term e-learning also refers to the demand for a more effective learning culture in which users can motivate themselves to learn. Herman (2015) demonstrated how e-learning could result in a flexible and distributed learning system. Students will have greater freedom in determining the time and location of their studies, as they will not be required to report to a specific location at a specific time. Additionally, distributed learning refers to instruction in which instructors, students, and instructional materials are located in different locations so that students can develop an understanding of time and location constraints.

Online teaching and learning methods are primarily student-centered, which necessitates active participation on the part of students, in addition to the teacher's role in leading and guiding learning activities (Maria et al., 2014). According to Huba and Freed (2000), this method enables students to more effectively master learning topics individually or in groups without the need for a teacher to be present in the classroom. Thus, this method is highly recommended for use during the learning process in place of the conventional method, as it can assist students in developing various skills such as critical thinking and problem-solving skills (Abdullah, 2004).

This statement is consistent with Chyun's (2007) findings that student-centered teaching methods can improve the quality of student learning, and teachers can reduce their reliance on conventional teaching methods in PdPc activities. Furthermore, technology-enhanced learning is a highly effective method of delivering student-centered content and enabling students to access information resources without restriction. The application of technology in conjunction with

appropriate learning methods can help create an interactive learning environment that effectively attracts students and assists teachers in delivering learning content. Hence, it can help students' comprehension even more (Siti Hajar, 2015).

Methodology

The study adopted survey research design, one of the quantitative methods. The selection of this method fits to analyze the position of the criteria of online learning effectiveness through the Relative Importance Index (RII) in the subject of Geography at the pre-university level.

Participants

The participants involved pre-university randomly selected students in the study area, which consisted of 135 of the 200 people in the study population. As seen in Table 1, the selection for the number of study samples taken is based on the sampling table by Krejcie and Morgan (1970) and the school's breakdown. The samples were taken at simple random sampling technique.

Data collection tool and the process

The research instrument used was a questionnaire developed by the researchers. Data collection process was conducted via distributing the questionnaire to pre-university students who was taking the subject of Geography in Perak. The questionnaire consisted of five parts: (A) background of the respondent, (B) students' interest in online learning, (C) students' acceptance of online learning, (D) effectiveness of online learning, (E) student achievement in online learning, and (F) respondents' views and suggestions. The items in Sections B to E use a 5-point Likert scale, where scale 1 = Strongly Disagree; 2 = Disagree; 3 = Neither agree nor disagree; 4 = Agree; and 5 = Strongly Agree. The item information of each study variable is described in Table 2. Experts also reviewed the items used for the study to ensure that the items and language were appropriate and accurate. Even as a result of the review of Cronbach's Alpha reliability values, all variables in the pilot study exceeded 0.6 (Table 2). According to Pallant (2010), a Cronbach's Alpha value of 0.70 or above

Table 1: List of and study samples

<i>Bil</i>	<i>Schools</i>	<i>Districts</i>	<i>Population</i>	<i>Sample</i>	<i>Percent (%)</i>
1.	SMK A	Kerian	22	20	14.8
2.	SMK B	Kerian	65	43	31.9
3.	SMK C	Manjung	33	22	16.3



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4.	SMK D	Batang Padang	51	34	25.2
5.	SMK E	Kinta Selatan	25	16	11.9
Total			200	135	100

Table 2: Numbers of items and source of each variable

Criteria	Numbers of item	Source	Pilot study (Cronbach's Alpha Value)
Interest	10		0.797
Acceptance			
Effectiveness			
Achievements			

Table 3: Level value RII

RII values	Importance Level	Symbol
$0.8 \leq RII \leq 1$	H	H
$0.6 \leq RII \leq 0.8$	M-H	H-M
	M	M
	M-L	M-L
	L	L

is a good and acceptable value for an instrument scale with ten or more items.

Criteria	Numbers of item	Source	Pilot study (Cronbach's Alpha Value)
Total	45		0.826
Modified from Faizah (2017)			0.878
Items were constructed according to the suitability of the	10		0.826
	10		0.878
	15		0.916

Findings

Respondent's Background

A total of 135 respondents were surveyed in this study, representing pre-university students from five schools in Perak that offer Geography. Based on the study findings, 29 respondents (21.5%) were male, while 106 respondents (78.5%) were female. Respondents were of various races; the majority (127 respondents; 94.1%) were Malay, followed by five Indian students (3.7%), and three Chinese students (2.2%). The

Analysis of the data

To identify important items influencing interest, acceptance, effectiveness, and achievement, frequency analysis and Relative Importance Index (RII) analysis were used. The formula used in this analysis is stated in the formula below.



$$\text{indeks relevan} = \frac{1n_1 + 2n_2 + 3n_3 + 4n_4 + 5n_5}{5(n_1 + n_2 + n_3 + n_4 + n_5)} = \left(\sum_{i=1}^5 w_i x f_{xi} \right)$$

n_1 = the number of respondents who answered strongly disagree

n_2 = the number of respondents who answered disagree

n_3 = the number of respondents who answered less agree

n_4 = the number of respondents who answered agree

n_5 = the number of respondents who answered strongly agreed

$$\text{indeks relevan} = \left(\sum_{i=1}^5 w_i x f_{xi} \right) \times \frac{100}{N}$$

w_i = respondent weighted, $i=1,2,3,4$ dan 5

f_{xi} = frequency of each respondent

f_{x1} = strongly disagree to f_{x5} = strongly agreed

N = the total number of respondents

Figure 1: Relative Importance Index (RII) Formula



purpose of this study was to determine the ranking criteria for each category of interest, acceptance, learning effectiveness, and achievement in the subject of Geography based on the respondents' preferences.

RII Analysis of Interest Criteria

The criteria were determined using RII analysis in order of relative importance. Table 4 summarizes the ranking results for each category based on RII analysis and RII cut-off values. Based on the ranking outcomes, ten criteria were developed to examine the relative importance of items for the interest variable. The index relative value (RI) for these ten criteria was between 0.8933 and 0.7259. Six criteria were determined to be of high importance (H), while four were identified to be of medium-high importance (H-M). The B3 criterion had the highest RI value (0.8933), the B2 criterion had the second-highest RI value (0.8815), and the B1 criterion had the third-highest RI value (0.8533). The B7 criterion had the third-lowest RI value (0.7496), followed by the B9 criterion with the second-lowest value (0.7437), and the B8 criterion with the lowest RI value (0.7259). The RII for the interest criteria was 0.8076 on average, placing it in the first position (Table 4).

RII Analysis of Acceptance Criteria

The RII analysis of the acceptance criteria showed the ranking results, and ten criteria were compiled to examine the relative importance of items for the acceptance variables. The RII criteria had a value of between 0.8296 and 0.5437. Four criteria were determined to be of high importance (H), five to be of medium-high importance (H-M), and one to be of medium importance (M). The criterion with the highest RI value (0.8296) was C10. The C2 criterion had the second-highest RI value (0.8193), while the C1 criterion had the third-highest RI value (0.8044). The C4 criterion had the third-lowest RI value (0.7541), the C2 criterion had the second-lowest value (0.7081),

and the C1 criterion had the lowest RI value average, the RII value of the acceptance criteria (H-M), which placed it in the third position.

RII Analysis of Learning Effectiveness Criteria

The results of the RII analysis for learning criteria are shown in Table 6 based on the rank. Ten criteria were assembled to determine the relative importance of items for learning effectiveness criteria. Six criteria had a value of between 0.8281 and 0.5704. Three criteria were determined to be of high importance (H), three to be of medium-high importance (H-M), and one to be of medium importance (M). The criterion with the highest RI value (0.8281) was D7. The D8 criterion had the second-highest RI value (0.8193) and the D1 criterion had the third-highest RI value (0.8163). The D4 criterion had the third-lowest RI value (0.7319), the D9 criterion had the second-lowest RI value (0.6163), and the D6 criterion had the lowest RI value (0.5704). The mean value of RII for the learning criteria was 0.7516 (H-M), which placed it in the fourth position. The overall RII value for the learning effectiveness criteria was 0.7516 (H-M), which ranked fourth.

RII Analysis of Achievement Criteria

According to the RII analysis results for achievement criteria, fifteen criteria were collated to examine the relative importance of items for achievement criteria. The RII criteria had a value of between 0.8207 and 0.7037. The analysis revealed that two criteria were of high importance (H), thirteen were of medium-high importance (H-M), and one to be of medium importance (M). The criterion with the highest RI value (0.8207) was A10. The A2 criterion had the second-highest RI value (0.8163), the A1 criterion had the third-highest RI value (0.7916), the A3 criterion had the third-lowest RI value (0.7541), the A2 criterion had the second-lowest value (0.7096), and the A1 criterion had the lowest RI value (0.7037).

Table 4: Ranking results of interest criteria

<i>Interest Criteria</i>	<i>Relative index</i>	<i>Ranking by category</i>	<i>Importance level</i>
B1 I would rather learn from what I see and hear.	0.8533	3	H
B2 I enjoy learning Geography through the use of a variety of visuals.	0.8815	2	H
B3 I like to learn when there is an interesting video display.	0.8933	1	H
B4 I am happy to learn using animation in Geography.	0.8400	4	H
B5 I look forward to going to school if teachers use video learning in PdP.	0.8207	5	H
B6 I never get bored in Geography class when I use Youtube to learn.	0.8030	6	H
B7 I can learn a lot of new things using Booklets.	0.7496	8	H-M



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B8	I am very comfortable using Quizlet.com to learn.	0.7259	10	H-M
B9	I prefer to learn using the internet rather than learning in a classroom.	0.7437	9	H-M
B10	I would instead learn to use the internet than reading notes from a reference book.	0.7644	7	H-M
	Overall ranking	0.8076	1	H

lowest RI value (0.7037). The RII value of 0.7684 (H-M) was in second place on average.

Prior to the outbreak of COVID-19, the MOE encouraged and exposed students to online learning. The data used throughout this study were collected before the implementation of online learning for all schools. This study's primary objective was to determine the relative importance of each criterion (interest, acceptance, learning effectiveness, and achievement) that influences pre-university students using online learning in the subject of Geography. The study finding for RII for the criteria of interest was placed in the first position. It demonstrated that elements shape the criteria for determining student interest in digital technology. The study result corroborated those of Habibah et al. (2004), who argued

that pictorial elements could pique students' interest, alleviate cognitive load, and foster curiosity in the teaching and learning of Geography. Even Shouye's (2017) study stated that when Geography videos were integrated into PdPc Geography, they are "interesting, useful and alive," and also stimulate students' thinking based on observations made (Guzman et al., 2017). The finding for the acceptance criteria, which came in third place behind the five primary criteria, indicated that students were still not fully exposed to technological aspects. It was also found out that time constraints were a significant factor in online learning; however, respondents could accept the media elements of the technology. Such a finding was consistent with Norah et al.'s (2013) assertion that the media played a critical role in enhancing the process of student comprehension.

Table 5: RII analysis of acceptance criteria

<i>Acceptance Criteria</i>	<i>Relative index</i>	<i>Ranking by category</i>	<i>Importance level</i>
C1 Due to a time constraint, using the internet to learn stresses me out.	0.5437	10	M
C2 Learning by using a booklet makes the information clearer and easier to understand.	0.7081	9	H-M
C3 The screen layout is more appealing to me as I use a video to learn.	0.8193	2	H
C4 I think that learning with a booklet is more effective because the content of the Geography topics is well structured and organised.	0.7541	8	H-M
C5 I believe that learning via the internet display text is simple to read.	0.7733	7	H-M
C6 I feel that learning by using Youtube is made easier by the use of simple icons.	0.7778	6	H-M
C7 I prefer to learn via the internet because of the captivating graphics.	0.7956	5	H-M
C8 I believe that online learning has a colour scheme that aids in the clear communication of content.	0.8044	3	H
C9 I am easy to understand when learning using a video because the language is simple.	0.8000	4	H
C10 I prefer to study on the internet because I can do so at any time.	0.8296	1	H
Overall ranking	0.7606	3	H-M

Table 6: RII analysis of learning effectiveness criteria

<i>Learning Effectiveness Criteria</i>	<i>Relative index</i>	<i>Ranking by category</i>	<i>Importance level</i>
D1 Online learning can assist me in honing my information-accessing skills.	0.8163	3	H
D2 Online learning enables me to relate topics learned in class more effectively.	0.8030	5	H



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D3	Online learning can assist me in improving my interpersonal communication skills with my friends.	0.7556	7	H-M
D4	Online learning can help me improve my communication skills with teachers.	0.7319	8	H-M
D5	Online learning enables me to concentrate more on the teaching and learning processes.	0.7674	6	H-M
D6	Online learning is incapable of clearly explaining the studied topic.	0.5704	10	M
D7	Online learning triggers my curiosity in the subject of Geography.	0.8281	1	H
D8	Online learning can help enhance new knowledge when compared to reference books.	0.8193	2	H
D9	Online learning is ineffective at increasing comprehension of the topics discussed.	0.6163	9	H-M
D10	Online learning can assist me in completing my assignment on time.	0.8074	4	H
	Overall ranking	0.7516	4	H-M



Table 7: RII analysis of achievement criteria

Achievement Criteria	Relative index	Ranking by category	Importance level
E1 I am aware of the learning objectives and goals.	0.7837	5	H-M
E2 It is relatively simple for me to understand a concept more effectively.	0.7733	8	H-M
E3 I am able to grasp the lesson content quickly with the use of engaging visual aids.	0.8163	2	H
E4 I can comprehend the critical learning contents through the use of appealing colours and graphics.	0.8207	1	H
E5 I understand the lesson content easily because of the numerous examples provided on Youtube.	0.7956	3	H-M
E6 I am able to minimise my reliance on reference books.	0.7570	11	H-M
E7 I am able to retain information much longer in my memory after learning from Youtube videos.	0.7600	10	H-M
E8 I can better explain the lesson contents when I use Kahoot or Pickers.	0.7037	15	H-M
E9 I am able to connect the subject learning in Geography to my daily life through Youtube.	0.7763	7	H-M
E10 I manage to solve problems in Geography by utilising Kahoot or Pickers.	0.7096	14	H-M
E11 I am capable of applying various techniques in learning from Youtube.	0.7704	9	H-M
E12 I can improve my technological abilities through video learning.	0.7822	6	H-M
E13 I am able to hone my map reading skills through video learning.	0.7467	12	H-M
E14 I am able to refine my field study skills through Youtube videos.	0.7452	13	H-M
E15 I am able to enhance my skills in learning Physical Geography through 0.7852 animated videos.	0.7852	4	H-M
Overall ranking	0.7684	2	H-M

Discussion

The fourth position was reserved for the criteria of learning effectiveness. The elements that quantify these criteria demonstrated respondents' proclivity in choosing to learn Geography based on their curiosity, and the use of online media as a means of attracting attention had a direct impact. This was consistent with the notion expressed by Nurul Nashrah et al. (2015) that the use of innovative teaching methods and approaches combined with creative planning could significantly improve students' comprehension. On average, achievement criteria came in second place. Visualisation techniques and elements were critical in motivating students to succeed. This study result corroborated those of Feng et al. (2018), who discovered that Geography subject using various techniques could help

students improve their knowledge, skills, attitudes, and values. The adaptable and enjoyable nature of Web 2.0 applications facilitated the execution of learning implementation activities. It could therefore significantly improve the quality of learning and teaching at multiple levels (Md Zuki & Khalid, 2016).

According to Mayer's (2014) Cognitive Theory of Multimedia Learning, online learning consisted of two distinct channels that contributed to information processing: audio and visual. This theory served as the primary guide for this study because numerous multimedia were used during the online learning process. This study proved that the type of teaching aids used affected how information was received into students' working memory. In addition, learning that was integrated with the constructivist theory directly assisted

students in acquiring new knowledge and integrating it with acquired experience while also relieving them of their reliance on the teacher entirely. **Conclusion**

Overall, the criteria of interest in this study were the responses of pre-university students to the use of online learning methods in Geography. Online learning using digital tools such as computers or mobile devices to support learning has become the norm for schoolchildren today. Direct exposure among educators and parents improved in using online learning applications. The study findings indicated unequivocally that the PdPc method should be presented engagingly to capture students' attention. Graphical elements, colours, and sounds were some of the elements that students favoured when using online learning methods that were not limited to discussions or one-way instructions. However, this study has the limitation that it only involves form six schools in one state in Malaysia and does not provide a picture of the findings for one country.

The Ministry of Education has always shared implementation methods and provided an online learning platform to promote online learning methods. Online learning emphasises technology and media and focuses on the use of effective teaching strategies and techniques. This provides teachers and students with indirect opportunities to acquire teaching knowledge while participating in activities that can help them learn more about a certain topic. Teachers are encouraged to strengthen teaching techniques and knowledge dissemination in schools using online learning to attract students' attention during the Geography PdPc session, while also enhancing technology skills and diversifying innovation and creativity without lowering students' academic achievements. **References**

- Abdullah, I. (2004). Pembelajaran berpusatkan pelajar dan kaitannya dengan pembangunan diri dan peluang pekerjaan. Published in Proceedings of the Seminar Penyelidikan Pendidikan Guru Peringkat Kebangsaan. Langkawi, Malaysia. [In Malay]
- Abdul Said, A., Baharom, M., Mohd Yusof, A., Mohamad Johdi, S., & Nelly, F. (2011). Keberkesanan penggunaan model bentuk muka bumi sungai bagi meningkatkan prestasi pelajar dalam mata pelajaran Geografi Tingkatan 1. National Seminar on History and Geography Education. Organiser & Venue: Universiti Malaysia Sabah, Kota Kinabalu, on 13 - 14 July 2011, (July), 1-12. Retrieved from <http://irep.iium.edu.my/30709/>. [In Malay]
- Akadiri O.P., (2011), Development of a Multi-Criteria Approach for the Selection of Sustainable Materials for Building Projects, PhD Thesis, University of Wolverhampton, Wolverhampton, UK.
- Che Ghani, C. K., Mai Shihah, A., Arasinah, K., Zaliza, H., & Ridzuan, C. (2016). Amalan gaya pembelajaran pelajar cemerlang di Politeknik Seberang Perai: Kajian pelajar Malaysia berdasarkan model Felder Silverman. *Geografia: Malaysian Journal of Society and Space*, 12 (3), 181-191. [In Malay]
- Chyun, L.T. (2007). Hubungan antara pendekatan pengajaran guru dengan pendekatan pembelajaran pelajar mata pelajaran kimia tingkatan empat. Master Dissertation, Universiti Teknologi Malaysia, Malaysia. [In Malay]
- Faizah, J. (2017). Bahan bantu mengajar (BBM) dalam pengajaran dan pembelajaran (P&P) di Sekolah Menengah Kebangsaan (SMK) Daerah Pontian. Retrieved from http://eprints.uthm.edu.my/9573/1/FAIZAH_JA'APAR.pdf. [In Malay]
- Faizatul Hafilah, A. H., & Nor Syahilia, A. (2010). Persepsi pelajar terhadap pembelajaran teradun (Blended learning). *Journal of Technical and Vocational Education*, 1(2), 53-62. [In Malay]
- Fazurawati, C. L. (2020, April 13). Pastikan pelajar tidak ketinggalan. *MyMetro*. Retrieved from www.hmetro.com.my/akademik/2020/04/565801/pastikan-pelajar-tak-ketinggalan. [In Malay]
- Felder R. M., Silverman L. K. (1988). Learning and teaching styles in engineering education. *Journal of Engineering Education*, 78 (7), 674-681.
- Feng, G., Lane, J., Stoltman, P. J., Khlebsova, O., Hao, L., & Weiguo, Z. (2018). Sustainable development in geography education for middle school in China. *Sustainability*, 10 (11), 1-27.
- Guzman, M., Olaguer, D. L., & Novera, G. (2017). Difficulties faced in teaching Geography lessons at public secondary school's division of Zambales, Philippines. *IOSR Journal of Humanities and Social Science*, 22 (9), 64-70.
- Habibah, I., Arumugam, R., & Teoh, A. N. (2004). Penggunaan multimedia interaktif dalam pembelajaran Geografi di persekolahan. *Persidangan Pendidikan Geografi Kebangsaan* (11), 2 (2), 1-17. [In Malay]
- Herman, D. S. (2015). The effects of multimedia and learning style on student achievement in online electronics course. *Turkish Online Journal of Educational Technology-TOJET*, 14 (1), 116-122.
- Huba, M. E. & Freed, J. E. (2000). Learner centered assessment on college campuses: Shifting the focus from teaching to learning. *Community College Journal of Research and Practice*. 24 (9), 759-766.
- Ibrahim, A. R., Mahamod, Z., & Mohamad, W. M. R. W. (2017). Pembelajaran Abad Ke-21 Dan Pengaruhnya Terhadap Sikap, Motivasi dan Pencapaian Bahasa Melayu Pelajar Sekolah Menengah. *Jurnal Pendidikan Bahasa Melayu -JPBM (Malay Language Education Journal-MyLEJ)*, 7(2), 77-88. [In Malay]
- Kocalar, A., & Demikaya, H. (2017). Geography teachers' views on effective Geography teaching. *Review of International Geographical Education Online*, 7(3), 332-346.
- Krejcie, R.V., & Morgan, D. W. (1970). Determining sample size for research activities. *Education and Psychological Measurement*, 30, 607-610.
- Masyuniza, Y. (2015). Hubungan sikap dan persepsi murid terhadap pembelajaran Bahasa Melayu dengan kemahiran abad ke-21. *Jurnal Pendidikan Bahasa Melayu - JPBM*, 5(2), 22-30. [In Malay]
- Mayer, E. R. (2014). Cognitive theory of multimedia learning. In M. Richard E. (Ed.). *The Cambridge handbook of multimedia*

- learning (2nd ed, pp. 44-71). United Kingdom: Cambridge University Press.
- Md Zuki, N.S. & Khalid. (2016). Penggunaan Web 2.0 dalam Pendidikan Abad ke-21 dalam Nabilah Othman, Chiang Wei Luan & Nurul Syaida Md Zuki. (Ed), Pendidikan Abad ke-21: Peranan Teknologi Maklumat dan Komunikasi serta Cabarannya. Fakulti Pendidikan UKM, Bangi. [In Malay]
- Mohammad Zohir, A. (2016). Pendidikan geografi di sekolah-sekolah Malaysia: Perkembangan dan isu. *Geografi*, 4 (1), 1-10.
- Mohd Faizal, M. (2012). Faktor yang berkaitan dengan pencapaian Matematik pelajar Melayu Sekolah Menengah Agama Daerah Pontian. (Tesis master). Retrieved from <http://eprints.utm.my/id/eprint/32080>. [In Malay]
- Muhammad Sukri, S., Mohd Anuar, A. R., & Ting, K. S. (2007). Kajian mengenai penggunaan e-pembelajaran (e-learning) di kalangan pelajar jurusan pendidikan teknikal dan vokasional di institusi pengajian tinggi (ipta) negeri Johor. *International Malaysian Educational Technology Convention*. [In Malay]
- Nor Zaira, R., Zolkefli, B., & Mohd Kasri, S. (2016). Faktor-faktor yang mempengaruhi penggunaan VLE Frog dalam kalangan guru di sekolah menengah. 1(October), 1023-1032. [In Malay]
- Norah, M. N., Nurul Izzati, H. & Radhiah, A. R. (2013). The framework for learning using video based on cognitive load theory among visual learners. Published in *Proceedings of the 5th Conference on Engineering Education*. pp. 15-20.
- Norazlina, A., & Abdul, R. I. (2013). Penggunaan internet dalam kalangan guru-guru sekolah rendah di sekitar Johor Bahru, Johor. 1-8. Retrieved from http://eprints.utm.my/11475/1/Penggunaan_Internet_Dalam_Kalangan_Guru.pdf. [In Malay]
- Norfadzilah, M. (2016). Pelaksanaan pembelajaran melalui Curriculum Information Document Online System (CIDOS) dalam memperkasakan pengajaran pensyarah di Politeknik. (Degree Thesis). [In Malay]
- Norfarahi, Z., Mohd Isa, H., & Khadijah, A. R. (2020). Isu dan cabaran penggunaan MOOC dalam proses pengajaran dan pembelajaran. *Journal of Research, Policy & Practice of Teachers & Teacher Education*, 10 (1), 1-18. [In Malay]
- Nurul Nashrah, S., Noor Hasimah, H., & Nur Aida, A. H. (2015). Matematik dan kemahiran abad ke-21: Perspektif pelajar. *Jurnal Pendidikan Matematik*, 3(1), 24-36. Retrieved from <http://journalarticle.ukm.my/>. [In Malay]
- Pablo, F. J., Esperanza, S. R., & Stephen, B. I. (2019). Improving the learning processes of Physical Geography through the use of landscape photographs in class. *Journal of Geography in Higher Education*, 43 (1), 24-39. <https://doi.org/10.1080/03098265.2018.1515189>.
- Rian, V. & Osman, K. (2013). Keberkesanan penggunaan pelbagai media pengajaran dalam meningkatkan kemahiran proses sains dalam kalangan pelajar. *Jurnal Pendidikan Malaysia*, 37(1), 1-11. [In Malay]
- Shahfiezul Shahaimi & Fariza Khalid. (2015). Persekitaran Pembelajaran Maya Frog (VLEFROG) di sekolah-sekolah di Malaysia: Pelaksanaan dan cabaran. Dlm. *Prosiding Seminar Kebangsaan Pendidikan Negara Kali Ke-5*. [In Malay]
- Shamsiah, S., & Azman, H. (2015). Kebolehan guru-guru mata pelajaran Geografi menggunakan teknologi maklumat dan komunikasi (TMK) dalam pengajaran dan pembelajaran di sekolah menengah Malaysia. *Journal of Global Business and Social Entrepreneurship (GBSE)*, 1(2), 35-43. [In Malay]
- Shephard, K. (2003). Questioning, promoting and evaluating the use of streaming video to support student learning. *British Journal of Educational Technology*, 34(3), 295-308.
- Shouye, D. (2017). Application of multimedia technology in the course teaching of Geography of China. In 7th International Conference on Education, Management, Computer and Society (EMCS 2017) (Vol. 61, pp. 347-351). Tonghua, Jilin: Atlantis Press.
- Siti Hajar, M. N. (2015). Tahap Penggunaan multimedia di kalangan guru sains dalam pengajaran sains KBSM. *Latihan Ilmiah Sarjana Muda Pendidikan Universiti Kebangsaan Malaysia*. [In Malay]
- Slameto. (2003). *Belajar dan faktor-faktor yang mempengaruhinya*. Jakarta: Rineka Cipta. [In Malay]
- Smaldino, S.E., Lowther, D.L., & Russell, J.D. (2008). *Instructional technology and media for learning*. NJ: Pearson.
- Yusup, H., Md Nor, S., Ismail, R., & Mahizer, H. (2013). Kompetensi pensyarah menggunakan pendekatan pembelajaran dalam talian (PDT) dalam sistem pembelajaran konvensional. Retrieved from https://www.researchgate.net/publication/259337692_Kompetensi_Pensyarah_Menggunakan_Pendekatan_Pembelajaran_Dalam_Talian_PDT_Dalam_Sistem_Pembelajaran_Konvensional. [In Malay]

