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Physical, Online, or Hybrid? A Study on the Preferred Mode of Learning of Multimedia University (MMU) Students

Marianne SM Too*, Roy KY Chang, Iksan Bukhori and Suleiman Aliyu Babale

***Abstract* – Higher institutions in Malaysia, including Multimedia University (MMU), has adopted online and hybrid learning mode for its students during the Covid 19 pandemic and post pandemic. At present, this practice is still on going, apart from the physical learning mode norm. This sparks an interest in determining the preferred mode of learning of MMU students and is the basis for this study. A total of 363 respondents from different faculties across both Melaka and Cyberjaya Campus partake in this study. Several tests were conducted on the data collected, including Cronbach Alpha, Pearson Correlation, and multiple linear regression (MLR). Results indicated the survey instrument used was reliable across all variables. Weak relationships were found among all predictors to the three preferred learning modes. Albeit this, the MLR tests were conducted. In conclusion, upon comparing the results, it was determined that the preferred learning mode of MMU students is the online mode.**

Keywords—Preferred Mode Of Learning, Alternative Learning, Kinect, Validity, Reliability.

I. INTRODUCTION

Traditionally, and prior to the onset of the COVID-19 pandemic, physical learning was the most used mode of learning, whether in elementary, secondary, or tertiary education. Physical learning, also known as face-to-face learning, students and instructors are physically present in the same learning environment [1], and students concentrate and interact with each other [2]. When COVID-19 hit mankind, online learning became the to-go method for all education institutions as traditional learning methods posed greater health risk to the students and teachers [3]. Reason being, one of the important tools for managing this disease is isolation of the patient to prevent spread [4]. In Malaysia, the government imposed a shutdown of all sectors, including education [5], thus online learning method was the new norm. Online platforms were used as classrooms, including Zoom, Google Meet, and Microsoft Teams [6]. Post COVID-19, another trend of learning emerged – hybrid learning. According to Owl Labs Staff [7], hybrid learning is an educational model where some students attend class in-person, while others join the class virtually from home using online platforms. In hybrid learning models, asynchronous teaching methods such as online exercises and pre-recorded video instruction, can be used to support face-to-face classroom sessions [7].

In MMU, classes are currently predominantly conducted physically. However, during special occasions (such as public holidays during the week), classes are conducted online. There are also special cases where hybrid learning is a necessity to cater for students who were not medically fit to attend the

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physical classes. Since all three learning modes are still applied thus, the objective of this paper is to conduct a study to determine the preferred mode of learning of MMU students as the outcome could give a glimpse into the future direction of learning mode for the university.

II. Literature Review

A. Modes of Learning

Physical learning includes discussion and interactions between students and instructors. In physical learning, instructors are the students' center of focus in receiving information and knowledge [8]. Kumari et al. [9] found that physical learning has fewer distractions than online learning, thus students were able to concentrate and understand the teaching materials better [2]. However, the downside to face-to-face learning includes health and safety concerns (crowded and shared learning environments increases viral transmission and risks); lack of flexibility where students and instructors need to attend fixed schedule and locations; and commuting and transportation hassle to the learning environment [10].

Law [11] described online teaching and learning as the process of instructing students using the internet. If there is ICT equipment and Internet connectivity, e-learning can be done anywhere, anytime, and around the time, overcoming the constraints of study area and time [12], providing adaptability [12], [13] and enhanced control over the educational environment [13]. Video conferencing services like Zoom, Google Meet, and Microsoft Teams gained popularity as teaching tools during the Covid-19 pandemic. Hawai.edu [14] identified several advantages of online learning, including: (a) it can be done at a time that is more convenient and productive for the student; (b) it can be done anywhere and involve instructors and students from all over the world; (c) it gives learning a new relevance in today's society and professional industrial practice; (d) it makes acquiring and sharing knowledge easier and more convenient; (e) it gives students access to a wider range of resources and information; (f) equal opportunity for students and instructors who are disabled or have accessibility issues that prevent them from attending face-to-face classes; (g) the advancement of digital literacy skills, which are becoming more and more important in today's society and workplaces; and (h) the simplification of several administrative aspects of teaching. Online education relies on specific resources, including high-speed internet, high-quality technological devices, and an appropriate learning environment [15]. Apart from this, online learning harmed students' communication with each other [16], [17] and their interaction with learning material [18]. Suffering from headaches, migraines, and eyesight problems were common health problems during online learning [18], [19].

Hybrid learning mixes both virtual and physical teaching methods [20]. The advantages of both face-to-face and remote/online learning are combined in hybrid learning. According to Olurinola et al. [20], the hybrid style of learning blends traditional physical instruction with online learning, creating a varied and rapidly growing field of design and investigation. During the physical or face-to-face portion of the mode, students in hybrid learning relish the chance to physically interact with their course lecturers and peers for discussions, debates, and questioning, among other purposes, to enhance their learning. When using the hybrid method, instructors take on the role of facilitators, guiding and supporting their students as needed. Additionally, they act as instructors by giving students supplementary instruction and course materials that correspond with online courses [20]. In terms of learning speed, the hybrid mode of education provides students with an easy way to learn at their own pace by utilizing rich media materials that are made available online. Limitations to this mode of learning include availability and accessibility of the tools needed; strong self-motivation and time management; reduced physical interactions; and designing the materials and plans to satisfy both online and physical mode requirements [21], [22].

B. Variables Influencing Mode of Learning

Perceived ease of use (PEOU) and perceived usefulness (PU) refer to the attributes of the Technology Acceptance Model (TAM) that influence technology adoption or implementation [23]. According to TAM, people will generally accept new technology if they find it to be beneficial and easy to use. TAM has been applied to education to evaluate students' behavioral intent to use e-learning resources [24]. PEOU states that a student will find a learning platform beneficial and helpful if they believe it is simple to use [25]. Taat and Francis [26] carried out a study at a teacher education institute in Malaysia to look at the degree of students' acceptance of e-learning and find elements that could influence it. This suggests that students' acceptance of e-learning, which can give them access to high-quality, timely, and correct information, is greatly influenced by PEOU as a convenience factor.

Perceived usefulness (PU) was defined as the individual's perception of the extent to which the use of a given technology improves performance. Taat and Francis [26] provided evidence that e-learning enhances learning performance and that enrolling in an online course can boost productivity. They showed a positive impact on e-learning adoption that could improve understanding and the efficiency of online learning. In general, Marikyan and Papagiannidis [27] found the effect of perceived usefulness was almost invariantly significant in relation to all types of technologies.

Kolb's experiential learning theory (ELT) is focused on experiential learning and the process of gaining knowledge through the combination of observing and evaluating a situation [28]. A range of course-based and non-course-based forms are available for experiential learning, including undergraduate research, capstone projects, volunteer work, service-learning, internships, student teaching, and foreign study [29]. ELT states that learning can only occur effectively if a person goes through a cycle of the following four stages: abstract conceptualization (AC),

concrete experience (CE), reflective observation (RO), and active experimentation (AE) [30]. These four phases not only enable students to fully explore a subject through a variety of perspectives and activities, but they also allow for the accommodation of various learning styles.

As stated by Kolb [28], a CE occurs when a real problem is presented in an authentic setting that prompts critical thought, recalls previously learnt information from long-term memory, pays attention to contextual cues, and starts the action process. This refers to the experience that the instructor has received and framed and thus share them to the students. By paying attention to the material and instructors, students learn from their experiences and engage in activities. According to Rawson et al. [31], a concrete example is an illustrative, real-world illustration of an abstract or declarative notion. One specific instance of deindividuation could be observed in situations when people are more willing to be candid in virtual conversations due to their anonymity than in physical interactions. Rawson et al. [31] demonstrated that the use of concrete examples during learning greatly increased psychology students' conceptual learning of abstract concepts, which forms a large part of the evidence foundation for the use of concrete examples.

According to Koong et al. [32], there is a strong correlation between the concept of RO and the proposed learning theory. Thinking reflectively is crucial for both teaching methods and education. According to Nurhidayah et al. [33], students who engage in self-assessment provide themselves with regular, in-depth feedback to help them learn more effectively. Along with communicating with their peers, parents, and teachers, students also share what they understand with them. By thinking back on what they have learnt, students increase their comprehension.

Making sense of these events is one of the phases in the learning cycle. By applying the concepts, they are familiar with, thinking back on past knowledge, or debating potential hypotheses with peers, the learner tries to make sense of the experience. When learners start to categorize concepts and draw judgements about the events that took place, they move from reflective observation to AC. This entails analyzing the encounter and drawing parallels with their present conceptual grasp. Ideas don't have to be "new"; students can evaluate fresh data and revise their judgements about preexisting concepts [34].

III. METHODOLOGY

A. Development of Proposed Conceptual Framework

The proposed conceptual framework (refer to Figure 1) was adapted from the related models discussed in Part II. Five variables (perceived ease of use, perceived usefulness, concrete experience, reflective observation, and abstract conceptualization) are proposed to influence the preferred mode of learning of students.

B. Development of Research Instrument

The proposed framework adapted questions from several different frameworks, namely, TAM and Kolb's ELT. The questions were edited to ensure their suitability to the targeted respondents. Respondents were required to choose responses using Boolean (for demographic questions), and 7-point Likert scale ranging from strongly disagree to strongly agree (for the remaining questions).

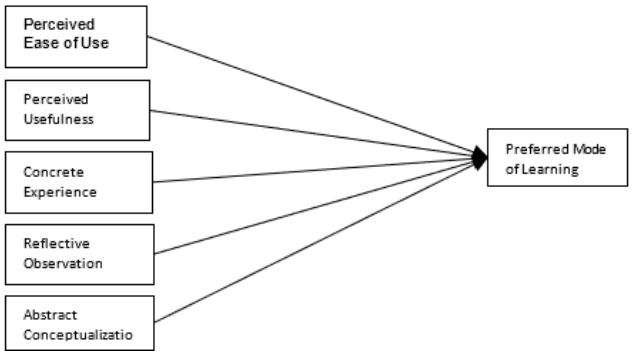

FIGURE 1. Proposed conceptual framework.

C. Procedure

A pilot study is conducted that applied the proposed framework discussed earlier using questionnaires as its instrument. By implementing the instruments to at least 12 to 50 people before the actual research will allow researchers to identify the strengths and weaknesses of the instrument, ready for any necessary modifications [41]. Thus, a sample total of 21 students were collected from MMU students from Melaka campus. A reliability test using Cronbach's Alpha is then performed on the pilot test. Reliability is defined by Braun et al. [35] as the stability and consistency of scores from an instrument. Cronbach's Alpha values of 0.7 or higher indicate acceptable internal consistency [36]. The following are the results of the pilot test: PEU: 0.867 (Online Learning), 0.857 (Hybrid Learning); PU: 0.743 (Online Learning), 0.910 (Hybrid Learning); CE: 0.876 (Physical Learning), 0.912 (Online Learning), 0.749 (Hybrid Learning); RO: 0.844 (Physical Learning), 0.708 (Online Learning), 0.932 (Hybrid Learning); AC: 0.764 (Physical Learning), 0.859 (Online Learning), 0.948 (Hybrid Learning); Preferred Mode (PM): 0.917 (Physical Learning), 0.941 (Online Learning), 0.782 (Hybrid Learning). Since all variables have reliability value of 0.7 and above, the variables indicated internal consistency and thus the same instrument is used in the next phase of the study.

Data was then collected from 363 MMU students, comprising of multiple faculties across both Melaka and Cyberjaya campuses. Several tests were conducted on the data collected, namely, Cronbach Alpha, Pearson Correlation, and Multiple Linear Regression (MLR). Pearson correlation is a bivariate analysis that measures the strength of association between two variables and the direction of the relationship, with the value of the correlation coefficient varies between +1 and -1 [37]. MLR is a statistical technique that uses several explanatory variables to predict the outcome of a response variable [38].

IV. RESULTS AND DISCUSSION

The Cronbach's Alpha reliability test resulted in above 0.7 for all the constructs in this study, showing at the very least a good reliability [36]. Table 1 shows the constructs and their Cronbach's Alpha. Overall, these results indicate that the instrument used has good reliability.

TABLE 1. Results for reliability test.

Construct	Cronbach 's Alpha
Perceived Ease of Use (Online Learning)	.758
Perceived Ease of Use (Hybrid Learning)	.915
Perceived Usefulness (Online Learning)	.891
Perceived Usefulness (Hybrid Learning)	.929
Concrete Experience (Physical Learning)	.921
Concrete Experience (Online Learning)	.837
Concrete Experience (Hybrid Learning)	.734
Reflective Observation (Physical Learning)	.853
Reflective Observation (Online Learning)	.818
Reflective Observation (Hybrid Learning)	.823
Abstract Conceptualization (Physical Learning)	.858
Abstract Conceptualization (Online Learning)	.886
Abstract Conceptualization (Hybrid Learning)	.916
Preferred Mode (Physical Learning)	0.833
Preferred Mode (Online Learning)	0.843
Preferred Mode (Hybrid Learning)	0.789

According to Wahyuni and Purwanto [39], Pearson correlation value of between 0.2 and 0.399 indicates a weak relationship between the variables, whilst value between 0.4 and 0.599 indicates a moderate relationship. This is true for both positive and negative values. Table 2 till Table 4 shows the correlation coefficient of the relationship between the dependent variable (preferred mode of learning) to their respective independent variables. As can be seen from the results, all relationships are weak except for the relationship between the online preferred mode of learning with the online reflective observation and online abstract conceptualization. Nevertheless, the results indicated that these variables have a linear relationship. For a positive relationship, a rise in the preferred mode of learning means students find the materials used for learning are easy and useful, able to form critical thoughts and learn from previous experiences and feedback, and thus able to categorize concepts and draw judgements about the materials which results in better understanding. For the preferred hybrid learning mode, a negative relationship exists. Students feel that a rise in hybrid mode reduces the ease of use and usefulness of the materials provided, they are not able to form critical thoughts, or learn from previous experiences and feedback, thus they find it difficult to draw conclusion and grasp a certain concept.

Three MLR analysis were conducted to examine the relationship between preferred modes of learning (physical, online, and hybrid) and five predictors: PEU, PU, CE, RO, and AC. All three overall models were statistically significant, F (3, 359) = 21.749, p<0.001 (physical mode); F (5, 357) = 22.277, p<0.001 (online mode); and F (3, 357) = 12.491, p<0.001 (hybrid mode). These indicate that the combined predictors significantly explained the variance in preferred learning mode. The three models accounted for a portion of the variance in preferred learning mode, specifically, R^2 = 0.154 (physical mode), R^2 = 0.238 (online mode), and R^2 = 0.149 (hybrid mode). The results are highlighted in Table 5.

TABLE 2. Results for correlation test for preferred physical learning mode.

Correlation Coefficient (Physical Learning)	CE	RO	AO
Preferred Mode	.317	.317	.372

TABLE 3. Results for correlation test for preferred online learning mode.

Correlation Coefficient (Online Learning)	PEU	PU	CE	RO	AO
Preferred Mode	.154	.238	.175	.401	.418

TABLE 4. Results for correlation test for preferred hybrid learning mode.

Correlation Coefficient (Hybrid Learning)	PEU	PU	CE	RO	AO
Preferred Mode	-.259	-.298	-.319	-.352	-.358

TABLE 5. Results for MLR's model summary and ANOVA.

Preferred Mode	R^2	F	Significance
Physical	.154	21.749	<.001
Online	.238	22.277	<.001
Hybrid	.149	12.491	<.001

The next three paragraphs detail out the results for the MLR's coefficients based on Table 6. For physical preferred learning mode, CE (t = 2.578, p = 0.01), and AC (t = 3.821, p < 0.001) showed statistically significant relationships with the physical preferred learning mode, while RO has no statistical significance (t = -0.881, p = 0.379). The regression equation for physical preferred learning mode was: Physical preferred learning mode = 1.763 + 0.152 (CE) – 0.077

(RO) + 0.318 (AC). The equation suggests that when RO and AC are held constant, the preference for physical learning mode will increase by 0.152% if the preferred physical learning mode increases by 1%. Similarly, when CE and RO are held constant, the preference for physical learning mode will increase by 0.318% if the preferred physical learning mode increases by 1%. However, when CE and AC are held constant, the preference for physical learning mode will decrease by 0.077% if the preferred physical learning mode increases by 1%. The standardized coefficients beta suggested that AC had the strongest positive impact (β = 0.341), followed by CE (β = 0.172), and RO (β = -0.086) with a negative impact. Overall, these findings suggest that abstract conceptualization and concrete experience are key influences in the preferred physical learning mode.

TABLE 6. Results for MLR's coefficients.

Variables	Un-standardized Beta	Standardized Coefficients Beta	t	Sig
Physical				
(Constant)	1.763			
CE	.152	.172	.578	.01
RO	-.077	-.086	-.881	.379
AC	.318	.341	3.821	<.001
Online				
(Constant)	2.541			
PEU	-.037	-.031	-.505	.614
PU	.076	.087	1.196	.232
CE	-.234	-.262	-3.409	<.001
RO	.173	.268	4.335	<.001
AC	.320	.383	5.642	<.001
Hybrid				
(Constant)	5.368			
PEU	.077	.088	1.025	.306
PU	-.078	-.092	-1.085	.279
CE	-.107	-.111	-1.560	.120
RO	-.094	-.098	-.980	.328
AC	-.183	-.208	-2.201	.028

Based on the online preferred learning mode results, CE (t = -3.409, p < 0.001), RO (t = 4.335, p < 0.001) and AC (t = 5.642, p < 0.001) showed statistically significant relationships with the online preferred learning mode, while PEU and PU have no statistical significance (t = -0.505, p = 0.614) and (t = 1.196, p = 0.232), respectively. The regression equation for online preferred learning mode was: Online preferred learning mode = 2.541 -0.037 (PEU) + 0.076 (PU) - 0.234 (CE) + 0.173 (RO) + 0.320 (AC). The equation suggests that when PU, CE, RO, and AC are held constant, the preference for online learning mode will decrease by 0.037% if the preferred online learning mode increases by 1%. Similarly, when PEU, PU, RO and AC are held constant, the preference for online learning mode will decrease by 0.234% if the preferred physical learning mode increases by 1%. On the contrary, when PEU, CE, RO, and AC are held constant, the preference for online learning mode will increase by 0.076% if the preferred online learning mode increases by 1%. There is also an increase of 0.173% if the preferred online learning mode increases by 1% when PEU, PU, CE, and AC are held constant. An increase of 0.320% also can be observed if the preferred online learning mode increases by 1% when PEU, PU, CE, and RO are held constant. The standardized coefficients beta suggested that AC had the strongest impact (β = 0.383), followed by RO (β = 0.268), CE (β = -0.262), PU (β = 0.087), while PEU had a negligence impact (β = -0.031). Overall, these findings suggest that abstract conceptualization, reflective observation, and concrete experience are key determinants in the preferred online learning mode.

As shown in the preferred hybrid learning mode results, only AC (t = -2.201, p = 0.028) showed statistically significant relationship with the hybrid preferred learning mode, while PEU (t = 1.025, p = 0.306), PU (t = -1.085, p = 0.279), CE (t = -1.560, p = 0.120), and RO (t = -0.980, p = 0.328) have no statistical significance. The regression equation for hybrid preferred learning mode was: Hybrid preferred learning mode = 5.368 + 0.077 (PEU) - 0.078 (PU) - 0.107 (CE) - 0.094 (RO) - 0.183 (AC). The equation shows that when PU, CE, RO, and AC are held constant, the preference for hybrid learning mode will increase by 0.077% if the preferred online learning mode increases by 1%. On the contrary, when PEU, CE, RO and AC are held constant, the preference for hybrid learning mode will decrease by 0.078% if the preferred hybrid learning mode increases by 1%. When PEU, PU, RO, and AC are held constant, the preference for hybrid learning mode will also decrease by 0.107% if the preferred hybrid learning mode increases by 1%. There is also a decrease of 0.094% if the preferred hybrid learning mode increases by 1% when PEU, PU, CE, and AC are held constant. Finally, the equation also shows a decrease of 0.183% if the preferred hybrid learning mode increases by 1% when PEU, PU, CE, and RO are held constant. The standardized coefficients beta suggested that AC had the strongest impact (β = -0.208), followed by CE (β = -0.111), RO (β = -0.098), PU (β = -0.092), and PEU (β = 0.088). Overall, these findings suggest that only abstract conceptualization is the key determinant in the preferred hybrid learning mode.

Since our study involves three different learning modes, interpreting MLR results involves evaluating model fit, examining individual coefficients, and comparing these findings across different study modes. In comparing all three of the preferred learning models and their results, MMU students prefer the online learning mode as evidence from the highest model fit among the three modes at R2 = 23.8%. Some fields of study have an inherently greater amount of unexplainable variation, thus the R2 values are bound to be lower [40]. Our study involves human choices; thus, the outcome is harder to predict than other concrete processes. As mentioned by Frost [40], other smaller number of variables, but not significant enough, contributes to the remainder of the

percentage. Furthermore, upon comparing the individual coefficients, all three learning modes had significant values for abstract conceptualization, but the online learning mode had the highest standardized coefficient Beta at 0.383. Another two variables (concrete experience and reflective observation) in the online learning mode also have statistical significance values, thus strengthening our outcome that online learning mode is the preferred choice for MMU students.

V. Conclusion

In conclusion, this paper has presented a study on examining the preferred learning mode of MMU students across both campuses. Three learning modes were presented – physical, online, and hybrid. A series of tests (Cronbach's Alpha, Pearson Correlation, and Multiple Linear Regression) were conducted on the collected data to determine the preferred learning mode. Results indicated a reliable instrument used and the predictor variables for all three learning modes have a linear relationship with the dependent variable. In comparing the three MLR results, it can be concluded from the model fit and the impact of the predictors that the online learning mode is the preferred mode of MMU students.

Based on the outcome, the study recommends that MMU research further and review the current teaching and learning mode to incorporate online mode as preferred by their students. Moving forward, the current study can be expanded to include participation from students in other tertiary learning institutions even including students at the secondary level.

Increasing usage of virtual learning environment (VLE) to enhance learning capabilities is an initiative which is part of the Malaysia Education Blueprint 2013–2025 [41], which emphasizes integrating technology into education. With that goal in mind, this research aims to shed some light on the new tools which were thrust into prevalence and usage due to challenging conditions caused by covid 19 to conduct online teaching and learning exercises. By identifying the students' preference for online mode over hybrid and physical, this can be a call to action for learning institutions to investigate further on the usage and implementation of online teaching and learning as the primary mode rather than because forced by the situation at hand.

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Author Contributions

Marianne Too: Data Curation, Literature Review, Methodology, Data Analysis, Writing – Original Draft Preparation;

Roy Chang: Conceptualization, Literature Review, Methodology, Discussion, Writing – Final Version Preparation;

Iksan Bukhori: Writing – Review & Editing;

Suleiman Aliyu Babale: Writing – Review & Editing.

Conflict of Interest

No conflict of interest was disclosed.

Ethics Statements

There are no ethical considerations to declare. This work does not involve human subjects, animals, or data from any social media platforms.

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