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Online Teaching & Learning of Post-Pandemic: The Study On Effectiveness Of Hybrid Online Class For Malaysian Polytechnic Architecture Students

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Abstract: The COVID-19 epidemic has altered the educational environment globally as society as a whole adjusts to the "new normal." Restorative justice practitioners in schools were compelled to innovate and adapt as a result of the shift to remote learning because theory and practice had largely concentrated on in-person education. Balancing technology, pedagogy, and the new Normal, evolved the post-pandemic challenges for Malaysian Polytechnic Architecture students. There are learning gaps to be concerned about after the pandemic. The goal of this paper is to identify the relationship between online learning and face to face towards student readiness. The polytechnic student with Diploma in Architecture was chosen as the population. In the study, a quantitative approach was used. As a sample, 108 Politeknik Sultan Abdul Halim Mu'adzam Shah architecture students participated in the study. A survey questionnaire was used as the main tool for research in this descriptive and statistical analysis. SPSS version 25.0 was used for the analysis of the data. The findings indicate that online learning factors and face-to-face factors have a significant relationship with student readiness. The outcomes would then be used as a model to improve teaching and learning. The result shows the students are ready for online learning but weakly ready for face-to-face learning. Despite the fact that we have reached endemic levels, the polytechnic education system makes every effort to guarantee that students can get the best education possible.

Keywords: *Technology acceptance model, Hybrid Online Teaching & Learning, effectiveness, Post-pandemic Challenges*

INTRODUCTION

The COVID-19 pandemic has made it clear that the right to education must be adaptable to various situations and the demands of communities that are developing. It is obvious that the right to education has to be updated and expanded. Human interaction and well-being must be prioritized in the reform of education. Technology is a powerful instrument, not a cure-all but a source of innovation and increased potential, especially digital technology that facilitates communication, collaboration, and learning across distance. Nearly three years of turmoil brought on by the COVID-19 pandemic and significant disruptions to learning. The effects of the crisis are reflected in the widening achievement and opportunity gaps, serious mental health worries, and intense expectations on teachers and educational leaders across the nation. But during the past three years, there has also been a surprising amount of innovation, resiliency at all levels of the educational system, and a reinvigorated dedication to helping children, families, and teachers. With more research on educational learning models, there are new chances for transformation that can make revolutionary ideas more practical. Hence, Jabatan Pendidikan Politeknik dan Kolej Komuniti (JPPKK) has created an action plan that mandates to conduct of all technical courses in a Blended Learning model, a combination of online and Face to Face Mode (Alsabah et al., 2021).

However, the adjustments or innovations that were made in the days and weeks immediately following COVID-19 are not always the adjustments that education will need to make in the face of profound societal changes in a post-COVID-19 world (Zhao & Watterston, 2021). Rather of taking this chance to rethink education, most of the reforms were focused on meeting

the immediate and urgent needs of continuing education, online teaching, and coming up with innovative ways to reach students at home. Although reasonable in the short term, these modifications will probably be viewed as insignificant in the long run. For a number of reasons, the COVID-19 pandemic has the potential to be a once in a generation opportunity for genuine change (Schleicher, 2020). First off, practically every educational institution was affected by the pandemic, which was global. As a result, it gives educators and students the chance to collaborate in order to reconsider the kind of education we actually need as opposed to the rigid and antiquated model that we are inclined to fervently adhere to. Second, educators from all around the world showed that they were capable of widespread transformation. Due to the epidemic, educational institutions were forced to close, leaving instructors, students, and adults to carry out education under quite different circumstances.

Problem Statement

This study aims to determine the relationship between online learning and face-to-face learning toward student readiness. As for architecture students of Polytechnic Sultan Abdul Halim Mu'adzam Shah, online learning has been a great challenge to them. A continuing study back in reality or face-to-face after the pandemic needs lots of adjustments and adaptation to the new normal (Biwer et al., 2021). The lack of social skills to interact with their classmates and lecturers affected the learning process (Ivanec, 2022). They prefer online classes as it's more flexible and studying in their comfort zone. Face-to-face learning sessions allow students and lecturers to maintain eye contact and observe one another's body language. However, in the online environment audio and video are used in its place, which might be disruptive if the line connection is poor. Only at a predefined moment, when both lecturers and students are simultaneously logged in to the learning management system, student consultation can take place. In other words, since group discussion integration in online classes is constrained by online learning, encouraging student participation through active learning can be extremely difficult. Plus, architecture students, need design consultations with lecturers on their design project tasks. Since the new norm requires the lecturer in redesigning course assessments and reorganising the course's material to accommodate online learning. Lecturers have to learn in adapting to new technologies of teaching & learning as well as the students. There are learning gaps to be concerned about after the pandemic (Namkung et al., 2022). The transition of different teaching & learning methods needs to be conducted particularly in embracing the challenges. Peer learning is as important as the learning process throughout the post-pandemic. Students need to rebuild their self-confidence and social skills though. Hence, they have to adapt both online learning and face-to-face learning skills. Therefore, this study's main objective is to determine the relationship between online learning and face-to-face learning toward students' readiness. Moreover, this study also will indicate online learning factors and face-to-face learning toward student readiness.

LITERATURE REVIEW

Impacts of the Pandemic on architectural education and its Prospects Blended learning: the new normal for teaching and learning.

We have encountered a multitude of learning situations that go beyond conventional classroom instruction as a result of the pandemic's quick shift to online learning. Even if not all students are taught online beyond Covid-19, blended learning; a combination of traditional classroom training and online instruction—is likely to become a common form of instruction in the field of architecture. The goal of blended learning is to increase educational effectiveness by

combining the benefits of in-person and online learning (Tong et al., 2022). This form of teaching and learning has been used in higher education for quite some time, and research on blended learning in health professions education has shown it is more effective than traditional classroom instruction in terms of knowledge acquisition (Kazu & Demirkol, 2014).

Towards student-centered learning environments.

Attempts were made to include more student-led learning activities as a result of abrupt modifications to architectural education curricula during the epidemic. One advantage of online education is that it promotes collaboration between institutions, which cuts down on duplication and helps a lot of students. Online learning is expected to promote more student-centered learning by offering customized learning for individual learners that enables learning on demand and at his or her own pace, increasing social interactions mediated by technology, and providing convenient access to learning resources (Hong et al., 2019). Baeten, (2010) states, a student-centered online learning approach will boost students' self-confidence and inspire them to be independent ()A better level of student engagement, enhanced intrinsic drive, and accountability for learning are just a few examples of how increasing student autonomy can improve learning results. A significant relationship between the online learning factor of the Polytechnic students' architecture indicates that they are well prepared for online learning as readiness is the main factor influencing a person's readiness to use online learning (Brush et al., 2003). Moreover, Perceived Usefulness (PU) is important to Behavioural intention (BI) in implementing online learning (Chang & Tung, 2008).

Challenges in improving the quality of hybrid education.

A number of issues need to be resolved in order to raise the standard of online teaching and learning in architectural education, as it is anticipated that this form of instruction will become increasingly important in the post-COVID age. Despite the fact that online learning has increasingly become a part of education, just moving traditional teaching techniques online won't help students learn anything (Frankfurt, 2020). Educators who have not previously taught online tend to use traditional teaching strategies, such as lectures, which are known to be unproductive. They should be knowledgeable about the various technologies that can be utilised to encourage student collaboration and creative activities in an online learning environment. Therefore, a system of support is needed at the university level that offers tailored assistance to instructors who have queries or need assistance with online teaching.

Applying assessments and evaluations online can be difficult depending on the course's nature and the sort of assessment. The online class has a serious impact on assessments and evaluation as the lecturers have to enforce changing their assessment types to fit the online mode (Thathsarani et al., 2023). However, some courses are difficult or impossible to teach and learn through online learning methods such as sports, nursing, laboratories, music, and art courses. As for architecture students, their design projects inquiries design consultation with the lecturers.

RESEARCH DESIGN

Participant

Malaysia has 36 polytechnics in total, but only six (6) offer a diploma in architecture program which are Politeknik Ungku Omar (PUO), Politeknik Sultan Haji Ahmad Shah (POLISAS), Politeknik Sultan Abdul Halim Mu'adzam Shah (POLIMAS), Politeknik Port Dickson (PPD), Politeknik Merlimau Melaka (PMM), and Politeknik Sultan Idris Shah (PSIS). The study population includes all six Malaysian Polytechnic that offer Diploma in architecture programs. However, only diploma architecture students of Politeknik Sultan Abdul Halim Mu'adzam Shah (POLIMAS) were selected as a sample because it can facilitate obtaining results within the budget and timeframe available. The polytechnic students from semester one until semester six were chosen because they are currently engaged in online learning due to the pandemic. The total number of students per semester is shown in Table 2 and was obtained from the Sistem Pengurusan Maklumat Politeknik (SPMP).

Table 1. Number of students enrolled for Diploma in Architecture, POLIMAS

No.	Institution	Sem 5
1.	Semester 1	26
2.	Semester 2	20
3.	Semester 3	18
4.	Semester 4	25
5.	Semester 5	28
6.	Semester 6	33
	Total	150

To reach the sample size of respondents specified by (Krejcie & Morgan, 1970), the data collection process started with the distribution of questionnaires to the target group. 108 people make up the sample for this study, which is based on (Krejcie & Morgan, 1970) and a population of 150. The chosen student was chosen as a respondent using simple random sampling. 108 POLIMAS students were chosen at random and received the survey via email in the current semester. Table 3 displays the respondents' demographic profile.

INSTRUMENT AND DATA COLLECTION

Data collection is done using a questionnaire survey form on an online platform. There are two sections to the questionnaire. The questionnaire's first section collected related demographic data, and its second section used a five-point Likert scale to gather data on the aforementioned variables. Previous studies (Davis, 1989) were consulted for perceived ease of use (PEU), perceived usefulness (PU), and behaviour intention (BI). The face-to-face factor (FF) was adapted from (Cho & Kim, 2021) the online learning factor was composed of ten elements from a prior study by (Baeten et al., 2010).

Table 2. Demographic Profile of Respondents

Measure	Gender	Frequency	Percent (%)
Gender	Male	47	43.5
	Female	61	56.5
	Total	108	100
Age	18	1	0.9
	19	29	26.9
	20	25	23.1
	21	24	22.2
	22	10	9.3
	23	10	9.3
	24	6	5.6
	25	1	0.9
	26	1	0.9
	34	1	0.9
	Total	108	100
CGPA	0.00 – 2.00	3	2.8
	2.00 – 2.50	11	10.2
	2.50 – 3.00	42	38.9
	3.00 – 3.50	42	38.9
	3.60 – 4.00	10	9.3
	Total	108	100

A brief introduction and a link to a Google Forms web survey were included in the invitations. All POLIMAS architecture students were sent invitations via telegram along with a link to the survey's Google form. All surveys are conducted electronically over the internet.

DATA ANALYSIS

Descriptive and statistical analysis were processed using IBM SPSS 25.0, Statistical Package for the Social Sciences. To ascertain the relationship between the variables, descriptive analysis for demographic information and inferential statistics were used. Additionally, a linear

regression was used to analyse the study's hypotheses and find out how student readiness for online learning in the present context affected the results.

Research Model and Hypotheses

The following model was proposed for this study. Online learning factors and face to face factors are independent variables. Student readiness including perceived ease of use, perceived usefulness and behavioural intention. Figure 1 shows the research model and hypotheses**.**

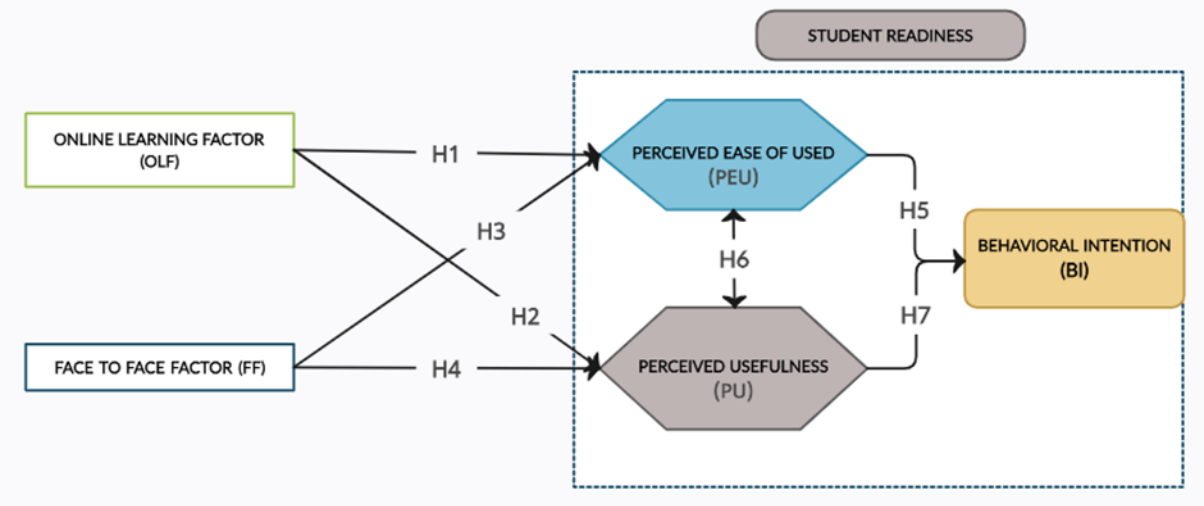

Figure 1. Research model and hypotheses

Online learning continues to be seen as an innovative, new form of education that gives an organisation new option and a novel way to approach problem-solving (Król, 2016). Traditionally, instruction has taken place in a classroom or under the guidance of an instructor, but an increasing number of institutions are now using technology to deliver instruction in novel settings after the pandemic. The online learning component is a crucial element in determining whether or not consumers will accept technology. Information technology has changed how knowledge is created, communicated, and disseminated in the educational process (Darab & Montazer, 2011). As a result, it is possible to create a time, place, and space barrier between the teacher and the student. Because of this, it's crucial to deliver course material using technology effectively (Lim et al., 2007). As a result, the following hypothesis was proposed:

H1: Online learning factors (OLF) have a direct positive significance to Perceived Ease of Use (PEU).

H2: Online learning factor (OLF) have a direct positive significance to Perceived Usefulness (PU).

H3: Face to face factor (FF) have a direct positive significance to Perceived Ease of Use (PEU).

H4: Face to face factor (FF) have a direct positive significance to Perceived Usefulness (PU).

H5: Perceived Ease of Use (PEU) will have a direct positive significance on the Behavioural intention (BI) to use online learning factor.

H6: Perceived Ease of Use (PEU) will have a direct positive significance on Perceived Usefulness (PU) of online learning factor.

H7: Perceived Usefulness (PU) will have a significant positive effect on the behavioural intention (BI) to use e- learning system.

Measurement Model

A measurement model is suitable for model testing, which confirms the measures' reliability as well as their convergent and discriminant validity if it is both accurate and valid. The Cronbach Alpha is calculated for this purpose, and as shown in Table 3, the Cronbach alpha value for each construct is greater than 0.65, exceeding the expected rational value of 0.60 (Nunnally, 1978). This makes sure that the reliability of the instrument is accepted for use.

Table 3. Cronbach Alpha test

Variables	**Items**	**Cronbach Alpha (>0.60)**
Online learning Factor (OLF)	EF1	0.908
	EF2	
	EF3	
	EF4	
	EF5	
	EF6	
	EF7	
	EF8	
	EF9	
	EF10	
Face to Face Factor (FF)	FF1	0.782
	FF2	
	FF3	
	FF4	
	FF5	
Perceived Usefulness (PU)	PU1	0.919
	PU2	

	PU3	
	PU4	
	PU5	
Perceive Ease of Use (PEU)	PEU1	0.924
	PEU2	
	PEU3	
	PEU4	
	PEU5	
Behavioral Intention (BI)	BI1	0.944
	BI2	
	BI3	
	BI4	
	BI5	

Table 4. Correlation between Variables (*n*=108)

Construct	OLF	FF	PU	PEU	BI
OLF	1.000				
FF	0.473**	1.000			
PU	0.767**	0.358**	1.000		
PEU	0.748**	0.422**	0.821**	1.000	
BI	0.746**	0.308**	0.804**	0.768**	1.000

RESULTS AND DISCUSSION

The purpose of this study is to determine whether students are prepared to continue their online education. To ascertain whether the student was prepared to use online learning, seven hypotheses were tested. In order to investigate the bivariate relationships between the variables, Pearson correlation was used.

Table 5. Result of Hypotheses Testing

Hypotheses	Standard Path Coefficients	T-Values	Significance	Support
H1: OLF□PEU	0.748	11.602	0.000	Yes

H2: OLF□PU	0.767	12.316	0.000	Yes
H3: FF□PEU	0.422	4.794	0.000	Yes
H4: FF□PU	0.358	3.946	0.000	Yes
H5: PEU□BI	0.768	12.364	0.000	Yes
H6: PEU□PU	0.821	14.832	0.000	Yes
H7: PU□BI	0.804	13.924	0.000	Yes

In Hypothesis 1, the relationship between the online learning factor and students' perceptions of usability is described. The relationship between the online learning factor and students' perceived use is statistically demonstrated in Table 5. ($p<0.05$). A strong positive correlation exists between the online learning factor and perceived use ($r=0.748$; $p=0.00$, p0.05). The theory is maintained. According to the outcome for Hypothesis 2, there is a statistically significant correlation between perceived usefulness and the online learning factor (p 0.05). There is a significant positive correlation between the perceived usefulness and the online learning factor ($r=0.767$; $p=0.00$, p0.05). The hypothesis remains valid. According to Hypothesis 3, there is a weakly positive relationship ($r=0.422$; $p=0.00$, p0.05) between face-to-face factor and perceived ease of use. This relationship is statistically significant between face-to-face factors and perceived ease of use. The theory is maintained. According to the findings for hypothesis 4, there is a weakly positive correlation between perceived usefulness and face to face factor that is statistically significant ($r=0.358$; $p=0.00$, p0.05) and the theory is maintained.

The relationship between the behavioural intention and perceived use is statistically significant and strongly positive, according to Hypothesis 5 ($r=0.768$; $p=0.00$, p0.05). The theory is maintained. Regarding proposition 6, the outcome demonstrates a correlation between perceived usefulness and perceived ease of use that is statistically significant and strongly positive ($r=0.821$; $p=0.00$, p0.05). The theory is maintained. According to the findings for hypothesis 7, there is a strong positive correlation between perceived usefulness and behavioural intention (BI) ($r=0.804$; $p=0.00$, p0.05). The theory is maintained.

As a result, there has been evidence of a significant relationship between the online learning factor and the perceived ease of use test. The outcome shows that every aspect of the hypothesis is confirmed. It is obvious that the majority of the Polytechnic students' architecture was completely prepared for the implementation of online learning during their lesson. According to (Brush et al., 2003), readiness is the main factor influencing a person's readiness to use online learning. The majority of students are well-prepared for online learning as a novel way to acquire knowledge, as can be seen from the result. This student-centered online learning approach will boost students' self-confidence and inspire them to be independent (Baeten et al., 2010). The finding from this study, also supported by (Chang & Tung, 2008), stated that PU plays an important role towards BI to implement online learning. The conclusion of this study, which was also supported by (Chang & Tung, 2008), stated that PU is crucial to BI's implementation of online learning.

CONCLUSION

This research paper's main contribution is to examine how prepared students are for the implementation of online learning at polytechnic. The result shows the students are ready for the online learning but weakly ready for the face-to-face learning. Despite the fact that we have reached endemic levels, the polytechnic education system makes every effort to guarantee that students can get the best education possible. Therefore, it's critical to make sure that students are capable of receiving hybrid learning at this time and are prepared for it in order for the educational system to function as effectively as possible. Our dream is to radically rethink education as we move past the COVID-19 pandemic and into an unknowable future. We want to implore academics, decision-makers, and educators to have the guts to make bold changes beyond merely altering the way that teaching is delivered in light of this exceptional opportunity. The modifications that we call for in this study are not novel, but they were never successful in gaining traction in the educational environment prior to COVID-19. But our most recent experience has made it even more critical for us to reconsider what is required, ideal, and even feasible for the next generations.

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