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E-Learning and Sustainability of Pondok Schools: A Case Study on Post Covid-19 E-Learning Implementation Among Students of Pondok Sungai Durian, Kelantan, Malaysia

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Abstract: In almost every corner of the world, the COVID-19 pandemic had disrupted daily life and work. During the pandemic, e-learning technologies were critical, and were the ideal alternative to the traditional classroom setting. Throughout the COVID-19 pandemic, Malaysia's education system placed heavy emphasis on online learning in connection with new technological advances as a mode of interaction to substitute direct conventional instruction. The aim of this research is to determine student acceptability of e-learning implementation following COVID-19 in a pondok school in Kelantan. This study is intended to ascertain the implications of students' characteristics and technology acceptance models as well as the moderation effect of familiarity with technology on their future behavioural intentions to use e-learning. This research used a quantitative technique and included 100 students from a pondok school in Kelantan. Self-administered questionnaires were used to gather data. Partial least square structural equation modelling (PLS-SEM) was used in the data analysis. Outcomes from this study showed that students' characteristics are positively affected by students' motivation, students' mindset, and computer competency. Perceived ease of use and perceived usefulness positively affect technology adoption. On the other hand, economic deprivation negatively affects technology adoption. Furthermore, students' characteristics and technology adoption positively affect the behavioural intent to continuously engage in e-learning in the future. However, familiarity with technology does not moderate the relationship between student characteristic and intention nor technology acceptance model and intention to use e-learning.

Keywords: COVID-19 pandemic, e-learning, acceptance, Pondok students

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1. Introduction

E-learning is a subset of online education that relies entirely on the internet and digital technology to provide instruction to prospective students [1]. Computer and software programmes also facilitate the learning process [2]. E-learning denotes an

information system that integrates a variety of educational aspects to provide students with a digital reality in which they can participate in activities such as discovery and audio-visual involvement in multiple subjects, as well as encourage interaction with peers and educators [3,4]. It was initially designed for working professionals who were incapable of undertaking formal education on a full-time basis [2]. Nonetheless, e-learning capabilities have expanded to support all categories of learners in tertiary education, such as full-time, part-time, or distance learners [5]. Due to the COVID-19 pandemic, e-learning has lately become a necessary component of all educational institutions around the world, including schools, colleges, and universities.

In general, the COVID-19 outbreak had upset human life and work in every part of the globe. In addition to other sectors, education was severely impacted. Nonetheless, education had to resume; therefore, e-learning was the most effective method in lieu of the conventional classroom environment [6]. Despite the e-learning system being seldom used prior to the pandemic, most students have accepted e-learning, although many felt that it was less attractive compared to the traditional education system [7]. The COVID-19 pandemic forced educational institutions to respond by swiftly transitioning to distance and online learning as a viable option [4,8,9]. E-learning technologies have become more crucial following COVID-19. E-learning systems may aid learning providers in organising, planning, executing, and monitoring their learning and teaching initiatives. It also aims to support instructors as well as schools and universities in promoting student learning during school and university shutdowns. Moreover, the bulk of these programmes are complimentary, thus providing ongoing education throughout the COVID-19 pandemic [8].

Although e-learning is the most appropriate strategy in the current environment, its implementation is fraught with difficulties. Some schools are in a particularly advantageous position to implement online teaching since studies do not require practical skills, which is one of the obstacles of e-learning on which attention should be focused [10]. E-learning, however, is not recommended for courses that require practical skills [11]. Furthermore, inadequate internet access, a lack of technical skills, low administrative support, insufficient content design, decreased students' motivation, reluctance to self-study, low availability of the required services and infrastructure such as high-speed internet access and computer literacy skills, along with the potential danger of test/examination misconduct, and inexperienced educators are just a few of the e-learning hurdles [4,12–14]. The Malaysian government has improved educational services by updating information and communication technology infrastructure and offering ongoing training for teachers to improve their information technology skills. The benefits, however, are exclusively available to the government and government-aided schools. As a non-governmental school, Pondok students face significant e-learning problems because they do not have access to government-provided infrastructure or teacher training. Pondok schools, as private educational institutions controlled by individuals, non-profit organizations, or Islamic foundations with limited financial resources, rely heavily on student fees and donations from stakeholders to operate and flourish. Regardless of the constraints, Pondok schools must provide e-learning to their students in order to adapt to the current circumstances.

While the majority of e-learning studies in Malaysia focus on higher learning institutions and teaching colleges [3,5,12,15], just a few research has been carried out to assess the acceptability of e-learning in schools. This research addresses that gap by examining the e-learning system acceptance and adoption by students in Pondok schools throughout the COVID-19 crisis.

The general objective of this study is to empirically investigate the contributing factors of the e-learning acceptance among students of Pondok school in Kelantan whereas

the contributing factors forms the main question in this study. Specifically, this study intends to link students' characteristics and the Technology Acceptance Model (TAM) to Pondok school students' acceptance and preparation for e-learning in the future. This research intends to measure the students' characteristics (students' motivation, mind-set, and computer competency) and the Technology Acceptance Model (perceive usefulness, perceive ease of use, and economic deprivation) to the students' acceptance and readiness (behavioural intention to continue using) of e-learning implementation post Covid-19 in a Pondok school in Kelantan.

The research is divided into multiple sections. First, this research examines an overview of e-learning and e-learning throughout the COVID-19 crisis. Next, this research discusses e-learning problems and the sustainability of pondok schools and the implementation of e-learning. This is followed by the research methodology, data collection, data analysis process, and a discussion of related theories and previous studies. To conclude the paper, the findings are discussed.

1.1 E-learning and Pondok School Sustainability

Generally, schools in Malaysia comprise national schools, national-type schools, government-aided schools, and private schools. Pondok schools are among the Islamic private schools that are run by individuals, non-profit organisation or Islamic Foundations. Historically, these schools have existed in Malaysia since the early 19th century and it was the place of choice for most Muslim parents to send their children for schooling. However, over the years, with the existence of government schools and modern Islamic schools (madrasah), Pondok schools were faced with great competition. Maintaining financial sustainability in the long run is among the biggest challenges faced by private Islamic schools in Malaysia [16]. Sufficient and sustainable financial earning is crucial for these schools to flourish, ensuring that the welfare of teachers and other staff is guaranteed, physical development runs smoothly as planned, creation of a conducive learning environment, and so forth. As non-profit organisations, most private Islamic schools in Malaysia experience insufficient funds that prevent them from further development and providing adequate facilities for their students. The reason for this is that most of these schools depend heavily on students' fees and financial contributions from their stakeholders [17].

In today's highly competitive and resource-scarce environment, Pondok schools need to create their own competitive advantage such as the ability to reduce unnecessary cost, as well as enhance their reputation and meet stakeholders' expectations to receive donations from the public. Several studies found that the use of e-learning in the education sector enabled these schools to reduce cost, meet stakeholder's needs, increase competition and innovation, preserve raw materials, faster and less time-consuming, increase job satisfaction, able to re-skill and retain employees, and reduce energy expenditure and carbon emissions [18–20]. The recent literature review argued that integrating sustainability in e-learning brought similar benefits to both stakeholders – students and lecturers [17]. While government schools and other type of schools in Malaysia had implemented e-learning to their education system, most of the Pondok schools still maintained their old education system. Only a few schools had modernised their education system and syllabus in line with the current education needs [17]. Furthermore, the COVID-19 pandemic made implementation of e-learning most vital. However, due to the inability to conduct e-learning, some Pondok schools had to totally suspend their teaching and learning sessions as most of these schools only used traditional teaching methods. In order to ensure the Pondok existence and sustainability in the future and to adapt to the current changes in technology and stakeholders' expectations, it is vital for the Pondok school management to implement e-learning in their education system. Implementation of e-learning will enable the Pondok schools to remain competitive in the education sector.

Thus, to ensure e-learning success, it is critical to the Pondok school's management to access the acceptance of e-learning in the future among their students.

2. Literature Review and Hypotheses

The creation of survey tools used to measure the intention to use (or the acceptance of) a new technology has been inspired by a number of theoretical views. The Technology Acceptance Model, or TAM, is a frequently used model for assessing e-learning acceptance and utilisation. Technology Acceptance Model considers perceived usefulness (PU) and perceived ease of use (POU) to be essential factors in influencing consumers' attitudes, intentions, and actual behaviour pertaining to using new technology. The main premise is that consumers are inclined to adopt new technology if they believe it is simple to use and can assist in their work. The Technology Acceptance Model has been utilised in a number of e-learning projects. By means of the technology acceptance model (TAM), Ratna and Mehra [21], for example, examined the reception and attitude of university students in India toward e-learning. From the findings, the researchers discovered that perceived usefulness moderated perceived ease of use and mindset, whereas mindset mediated perceived usefulness, perceived ease of use, and behavioural intent to engage in e-learning.

The Unified Theory of Acceptance and Use of Technology (UTAUT) is another popular approach. The UTAUT framework uses eight theoretical bases (such as the Innovation Diffusion Theory and the Technology Acceptance Model) to forecast intentions to adopt technology and behaviour based on four factors. The UTAUT framework has been used to model questionnaires in a variety of research investigations. For instance, Ngampornchai and Adams [14] investigated students' preparation for online learning in Thailand's northeast province. They discovered that performance expectancy and effort expectancy have a substantial positive link and are major markers of technological acceptance.

Several studies have been conducted to investigate students', teachers', and schools' acceptance and preparedness for online teaching and learning. Acceptance and readiness of students are a critical aspect of successfully implementing online learning [12]. Teachers' qualities [22–24], facilitating conditions [14,23–25], self-directed learning [26] and computers competency [6,27] are among the factors contributing to e-learning acceptance.

2.1 Students' Motivation

In educational research and practice, motivation has had a significant impact on learners' attitudes and learning habits [26]. Motivation has been proven to play a key role in technology adoption and e-learning in previous studies [6,27,28]. Because the nature of the online curriculum is mainly automatic, more personalized, and independent, learners must be sufficiently motivated to engage in successful online learning [27]. Self-efficacy is a critical factor in determining students' motivation, which is a significant aspect of their qualities. A motivated student will actively participate in classroom discussions and activities [6]. Students' inclination to register in e-learning classes may be influenced by the convenience and versatility of e-learning [29]. On the other hand, a lack of motivation for online learning has a negative impact on students' mental well-being or characteristics[30]. As a result, with regard to online learning, students' motivation is an imperative feature of the students' profile. Thus, the following hypothesis should be tested:

H1a Students' motivation in e-learning positively influences students' characteristics.

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2.2 Students' Mindset 198

Dweck [31] defined mindset as how people think about the mutability of intelligence and ability. Two categories of mindsets have been distinguished: fixed and growth mindsets. Those with a fixed mindset believe that the majority of their abilities are dictated by their intrinsic abilities. Individuals with a growth mindset believe that their capabilities change as a result of learning and experiences that promote skill development. Mindset refers to how much people believe their ability can be improved via hard work and perseverance vs. how much they believe their ability is fixed and unchangeable regardless of how much effort they put in. Students with a "growth" mindset believe that they may improve their ability via effort, hard work, and perseverance, whereas those with a "fixed" mindset feel that their ability is pre-determined and unchangeable regardless of effort or perseverance [32]. Students' mindset is a reflection of how students perceive and learn from an instructor. Baber's research [6] discovered a significant favorable influence on students' mindsets and characteristics, showing that a student's thinking about perceived learning is a critical element of students' characteristics. As a result, the following hypothesis must be confirmed: 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213

H1b Students' mindset in e-learning positively influences students' characteristics. 214

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2.3 Computer Competency 216

For effective use of information and communication technology (ICT) in learning, students require experience and some level of skills in ICT systems [33]. According to Alasmari [34], students with insufficient competency or a lack of exposure to educational technology will not make effective use of such resources since they lack the necessary skills. As a result, the findings imply that students' computer skills have a beneficial effect on their acceptance of an e-learning system. Additionally, in a study to ascertain the key indicators for accepting e-learning, Selim [35] revealed that computer competency demonstrated high levels of consistency, with students' personal computer experience being the most influential determinant of students' characteristics pertaining to the acceptance of e-learning. Consequently, the following hypothesis has been offered in this study: 217 218 219 220 221 222 223 224 225 226 227

H1cStudents' computer competency positively influences students' characteristics. 228

H3 Students' characteristics in e-learning positively influence e-learning acceptance. 229

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2.4 Perceived Usefulness 231

As stated by Davis [36], perceived usefulness is the range to which an individual feels that using a specific system would augment individual work performance. One of the most important indicators of e-learning intention is perceived usefulness, which has been verified as a construct to quantify the success of e-learning systems in several studies [3,21,23]. In research of 377 students at three public institutions in Thailand, Teo [24] revealed that perceived usefulness has a favorable influence on students' desire to utilize a specific system (e.g., e-learning). Students are more inclined to accept e-learning if they feel it will assist them in learning more effectively, being more adaptable, and achieving higher academic performance. For example, Quispe and Alecchi [37] identified several positive aspects of students' experiences with emergency remote learning throughout the COVID-19 pandemic, including the capacity to process classes for future references, the presence of Learning Management Systems to stimulate the growth of electronic databases, the ability to register in online courses rather than conventional classes, and location adaptability. Moliner, Valentin and Alegre [38] discovered a steady reduction in 232 233 234 235 236 237 238 239 240 241 242 243 244 245

the number of students who favored the first choice (online live sessions), with students gradually shifting to pre-recorded lectures since they preferred to see the teacher's explanations numerous times and regarded this technique as superior to online sessions. As a result, the following theory has been developed:

H2a Perceived usefulness of the learning management system positively influences e-learning acceptance.

2.5 Perceived Ease of Use

Davis [36], as cited by Nikou and Maslov [39] characterizes perceived ease of use as an individual's confidence that using a specific technology is effortless and simple. The simplicity of using an e-learning system enables students to focus on studying the course materials rather than making additional efforts to learn the instrument [40]. Furthermore, Ratna and Mehra [21] in their research discovered that perceived ease of use has a substantial positive effect on behavioral intent and practical usage of e-learning. Chang and Tung [41] demonstrated that perceived usefulness and perceived ease of use have a substantial effect on the behavioral intent to employ online learning course webpages. Furthermore, the study discovered that perceived ease of use increases the behavioral intent to utilize websites for online learning courses. As a result, the following hypothesis is proposed in this research:

H2b Perceived ease of use of the learning management system positively influences e-learning acceptance.

2.6 Economic Deprivation

Economic deprivation is defined by Bernburg [42] as financial difficulties at home and the difficulty of parents' paying for basic needs. The pandemic COVID-19, as well as the Malaysian government's movement control order, forced numerous businesses to close or scale back their operations. People's incomes were impacted as a result of the circumstances, with some losing their jobs and others receiving lower pay as a result of the salary drop. This circumstance has exacerbated the financial pressure on some families, who must spend money on the internet and gadgets in order for their children to participate in e-learning. Financial constraints and students' economic position have been identified in a few studies as impediments to successful e-learning implementation in higher education institutions [43–45]. Remarkably, research con-ducted by Lukas and Yunus [46] among Malaysian educators on e-learning difficulties throughout the COVID-19 crisis discovered that students from low-income households with guardians who lacked access to digital devices and had poor networks, as well as those who resided in the suburbs and rural areas, were more prone to failure in the e-learning scenario. This argument is in line with Chola [47], reporting that 83.0% of students said the COVID-19 problem had a financial influence on their education. This is due to the high cost of internet connectivity in Zambia, which is in addition to ordinary tuition rates. Accordingly, their e-learning experience suffered due to this predicament. Thus, the following theory is put forth:

H2c Economic deprivation will negatively affect e-learning acceptance.

H4 TAM of e-learning will positively influence e-learning acceptance.

2.7 Familiarity with Technology

The adaptation and readiness of e-learning purely depends on the degree of familiarity with the technology, level of awareness, and readiness to accept and adopt the e-

learning environment [48]. Past research on e-learning among developing countries argued that students' familiarity with computers and technology has a significant influence on the acceptance of e-learning [9]. On the other hand, the positive results contradict with findings from a study among undergraduate students in a public university in northeast Thailand by Ngampornchia and Adam [14]. Thus, the following hypothesis is projected:

H5 Familiarity with technology moderates the relationship between student characteristics and intention to accept e-learning.

H6 Familiarity with technology moderates the relationship between technology acceptance and intention to accept e-learning

3. Research Methodology

3.1 Participants

The participants in this study were students from Pondok Sungai Durian in Kelantan, Malaysia aged between 13-21 years old. This school was chosen because it is one of the few Pondok schools to employ e-learning during the school closure due to the COVID-19 pandemic. During the data collecting process, the school has roughly 75 students staying at hostels, while 275 others were staying at home for online learning. The survey was disseminated to the whole population, where 75 sets of questionnaires were posted to the students at their hostel, while the other students were surveyed through an online platform. As a result, 112 students respond to the questionnaires given which is equivalent to a response rate of 32%. All printed 75 sets of questionnaires were returned while only 37 students responded to the link given. Out of 112 responses, 12 questionnaires were identified as having a suspicious pattern. Therefore, only 100 questionnaires were found to be relevant and usable.

Table 1 describes the demographic statistics of the respondents in which the profile of the respondents was discussed; however, names were not included to protect privacy. Most of the students were between 16 and 18 years old (52%), followed by those between 13 and 15 years old (25%), and the remaining (23%) were between 19 and 21 years old. For economic background, most of the students came from a low-income group, with 72% of their parents' income being less than RM2,000 a month. 22% of the parents have an income of RM2,001–RM4,850 a month, while only 5% were from the middle-income and high-income groups. Only 37% of the students share devices used during online learning with other family members.

Table 1. Descriptive statistics of the respondents (n= 100)

Item	Option	Frequency	Percent
Age	13–15 years	25	25%
	16–18 years	52	52%
	19–21 years	23	23%
Parents' Income	RM2,000 and below	72	72%
	RM2,001–RM4,850	22	22%
	RM4,851–RM10,970	1	1%
	RM10,971 and above	4	4%
Sharing Devices	Yes	37	37%
	No	63	63%

3.2 Instrument and procedures

The designed questionnaire was divided into five sections (see Appendix A): (1) demographics; (2) behavioural intention to use e-learning constantly; (3) students' characteristics; (4) technology acceptance; and (5) familiarity with technology. The first section asks about demographics, computer device ownership, and Internet access. In section two, five items question the students' behavioural intention to use e-learning via 5-point Likert scale statements. Part three consists of 12 items that assess the characteristics of the students. Five of the elements were adopted from Selim [35], while the remaining seven items were adapted from Baber [6]. Part four has 11 items that assess technology acceptance, adapted from Baber [6] and Bernburg [42]. The final set of questions asks students to rate how often they use technology (from "never" to "every day"), which was adapted from Ngampornchai and Adams [14].

Initially, the questionnaire was developed in English before being translated into Malay. Three experts from the management of Pondok schools, as well as a senior lecturer from Universiti Malaysia Kelantan, were consulted for content validity. The school's administration has assisted in circulating a paper-based questionnaire for the students staying at the hostel. For the students staying at home, the questionnaire was distributed through WhatsApp. The request to participate was made by the respective teachers. The data was collected within 2 months, between early November 2021 and the end of December 2021.

The partial least square (PLS) structural equation modelling (SEM) technique was applied for data analysis in this research. In the field of behavioral science, partial least squares (PLS), a subset of structural equation modelling (SEM), is an effective technique for understanding predicted behavior. This method was chosen because it allows for the simultaneous examination of a number of dependent relationships, which is especially useful when the model contains both first-order and second-order latent variables [49].

4. Results

4.1 Measurement Model

In SmartPLS, the analysis can be conducted by using a 2-step approach as suggested by Anderson and Gerbing [50]. Following the guidelines of Hair [51] and Ramayah [52], firstly, the measurement model was tested to examine the validity and reliability of the instruments. Then, the structural model was run to test the hypothesis developed.

For the measurement model, loadings, average variance extracted (AVE), composite reliability (CR), Cronbach alpha and rho_A was assessed. Hair [53] posited that the values of loadings and AVE must be greater than 0.5, and the CR should be more than 0.7. Next, according to Hair [51], the Cronbach alpha value must be greater than 0.7, however the value between 0.6 to 0.7 is acceptable in exploratory research. Table 2 and Figure 1 depicted the loadings, composite reliability (CR), average variance extracted (AVE), Cronbach alpha and rho_A. The loadings, average variance extracted (AVE), composite reliability (CR) and Cronbach alpha of all items were above the threshold value except for one item in computer competency. Thus, in order to retain an average variance extracted (AVE) of above 0.50, one item in computer competency (item number CC5) has been removed due to weaker loading (below 0.50).

Table 2. Measurement Model

Construct	Item	Loadings	CR	AVE	Cronbach Alpha	Rho_A
Students' Motivation	SM1	0.735	0.875	0.636	0.852	0.857
	SM2	0.853				
	SM3	0.776				
	SM4	0.822				
Students' Mindset	MS1	0.741	0.822	0.606	0.675	0.682
	MS2	0.764				
	MS3	0.827				
Computer Competency	CC1	0.829	0.895	0.634	0.809	0.815
	CC2	0.835				
	CC3	0.850				
	CC4	0.819				
Perceived Usefulness	PU1	0.857	0.926	0.758	0.893	0.895
	PU2	0.902				
	PU3	0.903				
	PU4	0.817				
Perceived Ease of Use	POU1	0.860	0.896	0.685	0.845	0.86
	POU2	0.853				
	POU3	0.882				
	POU4	0.703				
Economic Deprivation	ED1	0.873	0.928	0.764	0.897	0.913
	ED2	0.878				
	ED3	0.915				
	ED4	0.828				
Familiarity with Technology	FT1	0.668	0.860	0.671	0.811	0.823
	FT2	0.607				
	FT3	0.820				
	FT4	0.785				
	FT5	0.695				
	FT6	0.534				
	FT7	0.653				
Behavioural Intention	BI1	0.904	0.953	0.836	0.934	0.935
	BI2	0.924				
	BI3	0.932				
	BI4	0.896				

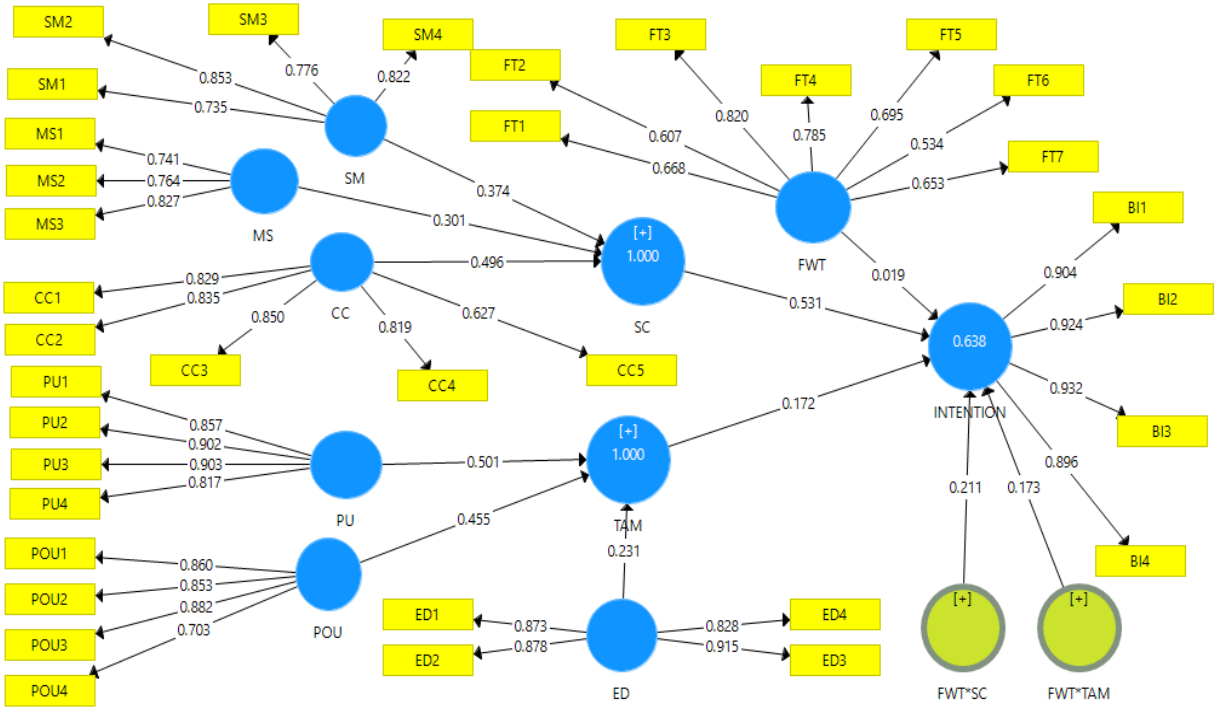

Figure 1. Measurement Model

Secondly, to assess the discriminant validity, this study used the HTMT criterion as proposed by Henseler [54] and updated by Franke and Sarstedt [55]. The cut-off stricter criterion for the HTMT values is 0.85 and the mode lenient criterion should be less than 0.90. Table 3 demonstrates the discriminant validity, which is established from the HTMT criterion as well given all values are less than 0.85 was established. Thus, it is concluded that the respondents understood and that the given constructs are distinct. When both of these validity tests are combined, it is clear that the items' measurement in this study is both valid and reliable.

Table 3. Discriminant Validity

	CC	ED	INT	MS	POU	PU	SM
CC							
ED	0.219						
INT	0.655	0.169					
MS	0.857	0.173	0.828				
POU	0.662	0.359	0.575	0.567			
PU	0.649	0.201	0.579	0.559	0.835		
SM	0.573	0.18	0.634	0.9	0.663	0.696	

Note: CC=Computer Competency, ED=Economic Deprivation, INT=Behavioural Intention, MS= Students' Mindset, POU= Perceived Ease of Use, PU= Perceived Usefulness, SM= Students' Motivation

4.2 Structural Model

The next phase in the data analysis process was to obtain the path coefficients in order to determine the relevance of the research model's hypothesised correlations. There were five steps to conduct structural model assessment, including assessment of collinearity, path coefficient, coefficient of determination, effect sizes (f2) and predictive relevance (Q2). Assessment of collinearity, coefficient of determination (R2) and effect sizes can be performed by using PLS algorithm procedure. Assessment of path coefficient and predictive relevance can be obtained through the bootstrapping technique with 5,000 resampling and blindfolding with 7 omission distance respectively.

The collinearity among latent variables was assessed through variance inflation factor (VIF). According to Kock [56], VIF value is a recommended approach to assess common method bias in PLS-SEM. All the VIF values illustrated in Table 4 were less than 5, thus indicating that there was no collinearity issue had occurred [57].

Table 4. VIF Value

Construct	SC	TAM	Intention
CC	1.75		
MS	2.48		
SM	1.842		
ED		1.139	
POU		3.45	
PU		3.208	
FWT*SC			1.065
FWT*TAM			1.173
FWT			1.365
SC			2.149
TAM			1.775

Note: SC= Students' Characteristics, TAM= Technology Acceptance Model, CC=Computer Competency, ED=Economic Deprivation, FWT=Familiarity with Technology, MS= Students' Mindset, POU= Perceived Ease of Use, PU= Perceived Usefulness, SM= Students' Motivation

Next, the path coefficient with confidence interval as showed in Table 5 revealed that students' mindset ($\beta = 0.301$, $t = 14.119$, LL = 0.270, UL = 0.341, $p < 0.01$), students' motivation ($\beta = 0.374$, $t = 11.750$, LL = 0.320, UL = 0.414, $p < 0.01$), and computer competency ($\beta = 0.496$, $t = 12.561$, LL = -0.308, UL = 0.351, $p < 0.01$) have a significant positive correlation with students' characteristics, thus, agreeing with hypotheses H1a, H1b, and H1c. In terms of the technology acceptance model (TAM) of an e-learning system, perceived usefulness ($\beta = 0.501$, $t = 12.418$, LL = 0.434, UL = 0.566, $p < 0.01$) and perceived ease of use ($\beta = 0.455$, $t = 13.387$, LL = 0.335, UL = 0.669, $p < 0.01$) have a significant positive effect while economic deprivation ($\beta = -0.231$, $t = 2.894$, LL = 0.061, UL = 0.336, $p < 0.05$) has a significant negative effect. Hence, hypotheses H2a, H2b, and H2c were also supported.

Following that, both latent variables of second order construct namely students' characteristics (β = 0.531, t = 5.249, LL = 0.443, UL = 0.757, p< 0.01) and the technology acceptance model (TAM) attributes (β = 0.172, t = 2.119, LL = 0.014, UL = 0.322, p < 0.05) were positively associated with the dependent variable of behavioural intention. Thus, hypotheses H3 and H4 are accepted.

Table 5. Path Coefficient Assessment

Hypotheses	Relationship	Std. Beta	Std. error	t-value	p-value	LL	UP	Decision
H1a	SM → SC	0.374	0.032	11.750	0.00	0.320	0.414	Supported
H1b	MS → SC	0.301	0.021	14.119	0.00	0.270	0.341	Supported
H1c	CC →SC	0.496	0.039	12.561	0.00	-0.308	0.351	Supported
H2a	PU →TAM	0.501	0.04	12.418	0.00	0.434	0.566	Supported
H2b	POU →TAM	0.455	0.034	13.387	0.00	0.335	0.669	Supported
H2c	ED → TAM	-0.231	0.08	2.894	0.002	0.061	0.336	Supported
H3	SC →INT	0.531	0.101	5.249	0.000	0.443	0.757	Supported
H4	TAM → INT	0.172	0.081	2.119	0.018	0.014	0.322	Supported

Note: SC= Students' Characteristics, TAM= Technology Acceptance Model, CC=Computer Competency, ED=Economic Deprivation, FWT=Familiarity with Technology, MS= Students' Mindset, POU= Perceived Ease of Use, PU= Perceived Use-fulness, SM= Students' Motivation

4.3 Evaluating the effect size

The coefficient of determination (R2), the effect size (f2), and the predictive relevance (Q2) of students' characteristics (SC), Technology Acceptance Model (TAM) and familiarity with technology (FWT) on behavioural intention are all shown in Table 6. The coefficient of determination (R2) value is the proportion of variation in the behavioural intention that is explained by all the exogenous constructs (SC= Students' characteristics, TAM= Technology Acceptance Model, FWT= familiarity with technology, FWT*SC and FWT*TAM) in the research model. The study's R2 value is 0.636, describing moderate level of predictive accuracy [51]. This indicates that the students' characteristics, technology acceptance model and familiarity with technology, account for 63.6 percent of the variation in intention. Hair [51] stated that Q2 is a metric of the model's and its parameter estimations' ability to recreate observed values accurately. If Q2 > 0, the model is predictively relevant. The Q2 value for this model is 0.460, greater than Hair et al.'s cut-off value [51]. The findings indicated that the students' characteristics (SC), Technology Acceptance Model (TAM), familiarity with technology (FWT), FWT*SC and FWT*TAM constructs have predictive relevance for the intention. Cross-validation of redundancy metrics demonstrates that the structural model used in this work is predictive in nature. The effect

size (f2) allows the researcher to observe the effect of each exogenous construct on endogenous constructs. Based on this study, the effect of students' characteristics (SC), Technology Acceptance Model (TAM), familiarity with technology (FWT), FWT*SC and FWT*TAM on intention were examined. Cohen [58] proposed that the f2 coefficients value of higher than 0.02, 0.15 and 0.35 are indicated as small, medium and large effect respectively. Table 6 showed that SC, FWT*SC and TAM has large, medium and small influence on behavioural intention respectively. On the other hand, FWT and FWT*TAM had no effect towards behavioural intention. This finding was consistent with the path coefficient assessment obtained in Table 5.

Table 6. Coefficient of determination, effect size, and predictive relevance

Construct	f^2	Decision	R^2	Q^2
SC	0.362	Large effect	0.636	0.460
TAM	0.046	Small effect		
FWT	0.001	No effect		
FWT*SC	0.198	Medium		
FWT*TAM	0.099	No effect		

Note: SC= Students' Characteristics, TAM= Technology Acceptance Model, FWT=familiarity with technology

4.4 Moderator Analysis

The interaction between FWT*SC and FWT*TAM shown in Table 7 was positive. The positive relationship between (FWT and SC) and (FWT and TAM) would be weaker when SC or TAM decreased. However, both of these interactions were not significant as the t-values obtained for hypotheses H5 and H6 were less than 2.33 or 1.645. Hence, there were no moderating effects found for this tested PLS-SEM model, indicating that H5 and H6 were not supported. Based on [52]), there were no further procedures like interaction plots as the moderating effect is not significant.

Table 7. Result of Moderator Analysis

Hypothesis	*Relationship*	Std Beta	*Std. Error*	*t-value*	*Decision*
H5	FWT*SC →Intention	0.211	0.121	0.964	Not supported
H6	FWT*TAM →Intention	0.173	0.049	0.855	Not supported

Note: SC= Students' Characteristics, TAM= Technology Acceptance Model, FWT=familiarity with technology

5. Discussion

The results from this study discovered that students' characteristics had a significant positive impact on their desire to continuously use e-learning in the future and the standardized path coefficient is 0.531 ($p<0.05$). Thus, this study proposed that students' characteristics are critical to success and play a critical role in online education, as shown by this research, which is consistent with the findings of past research by Callo [9] and Baber [6]. Additionally, a key finding of this study indicated that students' characteristics are positively influenced by motivation, mindset and computer proficiency. Indeed, the study found that student motivation is the key indicator that sufficiently managed to

promote awareness of the importance of continuing studies using e-learning among the students under study.

In addition, the study found that efficiency in the use of computers also had a positive effect on the implementation of e-learning among the students involved. Thus, the finding of this study is in line with the study by Ibrahim [59] and Lee [60], which indicates the importance of the computer self-efficacy on the user's behavioural intention to use of technology. In fact, the COVID-19 pandemic had produced a very significant impact on the use of e-learning among Pondok school students. Undeniably, this particular finding of the study is relevant to the current situation which demands that learning is implemented virtually and should not only focus on students in the national stream schools, but also those in the religious streams.

The outcomes of this research also demonstrate that Technology Acceptance Model (TAM) represented by perceived ease of use (PEOU), perceived usefulness (PU) and economic deprivation appear to have a positive impact on the acceptance model for e-learning with the standardized path coefficient of 0.172 ($p<0.05$). In detail, it is demonstrated that both PEOU and PU appear to have a significant positive impact on the acceptance model for e-learning, as other studies have revealed [6,61,62]. Interestingly, amid the myriad challenges faced by many during the COVID-19 pandemic, this study managed to reveal findings that are linked to the financial struggles commonly faced by students in their effort to implement e-learning more effectively. The poor economic situation that struck many people, thanks to the closure of several business sectors and the fact that not all of the participating students come from high-income families, have also affected the ability of parents to provide information technology devices to their children, resulting in the ineffective implementation of e-learning. This indirectly reduces the motivation of students to continue their studies as they would in a normal situation. In fact, the study found that 72 percent of the students are from low-income families.

In addition, this study also found that familiarity with technology does not simplify the relationship between students' characteristics and intentions or the technology acceptance model with their intention to pursue e-learning.

Therefore, this study presents several suggestions and approaches that can be adopted by various parties to ensure that e-learning among students in the Pondok schools runs well despite the constraints generated by the dynamics of the COVID-19 pandemic. These parties include the schools, parents, and families of the students as well as the Government.

One of the approaches that can be embraced by the school is to ensure that the information technology infrastructure and facilities are in good condition, and that they can be used perfectly for teaching and learning purposes. Furthermore, strong cooperation from providers and suppliers of telecommunication equipment should also be encouraged so as to provide the best possible infrastructure available to be benefited by all.

As far as cooperation is concerned, bilateral cooperation can be established between the school and telecommunication facility providers in the context of the corporate social responsibility (CSR) programme of the telecommunication companies. In addition, there are multiple initiatives that a school can introduce such as awareness campaigns which can attract the local community to contribute to the endowment fund intended for the provision of telecommunications infrastructure such as computer devices to students. The approach of introducing Islamic elements such as sadaqah and waqaf in this effort is both relevant and most appropriate, especially in the context of providing benefits to students in Pondok schools. This approach can certainly alleviate the economic burden borne by many of the students' families, who struggle to provide basic information

technology equipment and facilities for the effective implementation of e-learning of their children.

In addition, the school can also put in place an initiative of actively applying for funds or financial contributions from the state's zakat manager using the context of *asnaf fisabillilah* for the financially-struggling students. This initiative can directly establish a strong financial ecosystem for the benefit of the school, students, and families as e-learning can be effectively implemented without the typical financial constraints facing the community. Indeed, support in the form of financial assistance in the context of Islamic social finance will certainly provide the most optimal benefits to every stakeholder as well as the ability to produce students who can be characterized as *Al-falah* (success and salvation).

The study also suggests that in order to increase the feasibility of e-learning among students in Pondok schools, the Government should give equal focus to the much broader learning ecosystem in Malaysia. It is important that students in the religious streams studying in Pondok schools are not left behind in online learning, especially in the current context of the COVID-19 pandemic that has unfortunately hit these students the hardest. In general, it is observed that the Government nowadays seems more focused on issues beleaguering national stream schools when compared to alternative stream education such as the Pondok schools.

Therefore, a specific mechanism needs to be devised by the Government to ensure that students in Pondok schools also have equal access to the same quality education as those in the national stream, especially in terms of information technologies infrastructure, teaching and learning equipment, and having more qualified teachers. This mechanism can directly increase the motivation of Pondok school students, allowing them to have a more positive mindset to continue their studies and enjoy the larger benefits of education. This will be beneficial not only for the students' futures, but it can also be translated into the country's goal as spelt out in the Vision of Shared Prosperity 2030.

On top of that, this study recommends that the empowerment of Pondok schools is implemented holistically, not only in the form of syllabus but also in the context of the teaching and learning methods in order to keep pace with the Fifth Industrial Revolution (5IR). In addition, the empowerment of Pondok schools is expected to improve the quality of human capital in line with the United Nations Sustainable Development Goals (SDGs), especially in achieving the goals of SDG1:no poverty; and SDG4: quality education.

In order to give a deeper meaning to this study in the future, it is suggested that the study adopts qualitative methods of research. This is helpful in providing a more detailed picture on the student acceptance level towards the implementation of e-learning following the COVID-19 pandemic in Pondok schools. At the same time, Focus Group Discussion (FGD) techniques and Nominal Group Technique (NGT) can also be adopted for future studies with varied findings.

6. Conclusion

The rising use of web-based technology and the internet in education is a worldwide trend that affects all educational institutions, not just those providing postsecondary education. The COVID-19 crisis had pushed the government to transition from school-based teaching and learning activities to home-based remote instruction (e.g., web-based learning, e-learning, m-learning). Due to the state of COVID-19 statistics in Malaysia, the Ministry of Education (MOE) Malaysia had mandated all types of schools, including private schools, to suspend physical operation and conduct teaching and learning sessions virtually from home. In addition, the MOE extended the home teaching and learning

session (PdPR) from 1st September to 31st October 2021, resulting in the PdPR sessions lasting almost 5 months. Despite the fact that e-learning is the most appropriate strategy in the current environment, its implementation is fraught with challenges and difficulties.

Considering this, the purpose of this study was to determine the factors influencing behavioural intention to use e-learning post Covid-19 among students of Pondok school in Kelantan, Malaysia. The study was conducted in a focused environment in a Pondok school involving a total of 100 students. The partial least square (PLS) structural equation modelling (SEM) technique was utilized with 35 indicators among different level. The student characteristics (students' motivation, students' mindset and computer competency) as well as technology acceptance model (perceived ease of use, perceived ease of use and economic deprivation) were the variable considered and were all found to be significant. Based on the findings, it can be concluded that students' characteristics were positively influenced by motivation, mindset, and competence in the use of computer equipment, leading to a positive influence on students' acceptance level towards e-learning implementation. Next, the students' intention to use e-learning in the future was positively affect by technology acceptance with perceived ease of use and perceived usefulness give a positive impact on the technology acceptance model. However, technology acceptance was negatively affected by economic deprivation. Additionally, familiarity with technology were tested to see the moderating effect between student characteristics and technology acceptance model with the behavioural intention to use e-learning post Covid-19. However, the results for both moderating effects were not significant.

There are several limitations of this study. Firstly, the main limitation for this study is time whereby this study is conducted in a short period of time. The limited time spent resulted in the insufficient time used for data collection. As a result, the number of response rate is less than 40%. Secondly, the findings and implications of this study are obtained only from a single institution, which is the students who currently studying at Pondok Sungai Durian, Kelantan, Malaysia. Thus, this limitation needs to be considered when generalizing the findings of this study to other user groups or organizations. Despite its limitations, the findings of this study provide several implications for the educational institutions especially among Pondok schools and the result from the study as well as the suggestions presented can be used as a bench mark and guide for other Pondok schools to follow suit.

Supplementary Materials: The following supporting information can be downloaded at: www.mdpi.com/xxx/s1, Figure S1: title; Table S1: title; Video S1: title.

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Appendix A: The construct and measurement items

Construct	Item	Measurement	References
Student Motivation	SM1	In an online class, I prefer assignments and questions that challenge me so that I can learn new things.	[6]
	SM2	When I have the opportunity in the online class to choose class assignments, I choose the assignments that I can learn from even if they don't guarantee any grades	
	SM3	I want to do well in the online class because it is important to show my ability to my family and friends	
	SM4	I like to be one of the most recognized students in the online class	
Student Mind Set	MS1	I learn best by absorption (i.e. "sit still and absorb'')	[6]
	MS2	I learn best by construction (i.e. by participation and contribution)	
	MS3	I learn better by construction than absorption	
Computer Competency	CC1	I enjoy using personal computers	[35]
	CC2	I use the personal computers for work and play	
	CC3	I was comfortable with using the PC and software applications before I took up the e-learning based courses	
	CC4	My previous experience in using the PC and software applications helped me in the e-learning based courses	
	C5	I am not intimidated by using the e-learning based courses	
Perceived Usefulness	PU1	E-learning improves my ability to accomplish academic tasks.	[6]
	PU2	E-learning increases my productivity in accomplishing academic tasks.	
	PU3	E-learning enhances my effectiveness in accomplishing academic tasks.	
	PU4	I find the online learning system E-learning useful in my study completion.	
Perceived Ease of Use	POU1	I find it easy to use e-learning to do what I want it to do.	[6]
	POU2	I find the e-learning is clear and understandable for me	
	POU3	It is easy for me to become skillful at using e-learning	
	POU4	I find the e-learning easy to use.	
Economic Deprivation	ED1	Your parents' financial status is bad.	[42]
	ED2	Your parents cannot afford to own and operate a car.	
	ED3	Your parents hardly have enough money to pay for basic necessities (e.g. food, housing, phone).	

	ED4	Your parents cannot afford the type of leisure activity that you would most prefer to practice (e.g., music or sports).	
Familiarity with Technology	FT1	Word processing (eg: Microsoft Word)	[14]
	FT2	Spreadsheet (eg: Microsoft Excel)	
	FT3	Email	
	FT4	Search Engine (eg: Yahoo, Google)	
	FT5	Forum	
	FT6	Text Chat (eg: Whatsapp)	
	FT7	Video Chat (eg: GoogleMeet, Skype,Zoom)	
Behavioral Intention	BI1	I intend to use e-learning (Zoom and LMS) in the near future.	[6]
	BI2	I predict I would use e-learning (Zoom and LMS) in the near future.	
	BI3	I plan to use e-learning in the near future.	
	BI4	I intend to use e-learning for learning as often as needed	

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