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ONLINE LEARNING READINESS AND SATISFACTION DURING COVID-19 PANDEMIC AMONG UNIVERSITY STUDENTS IN FOUR ASIAN COUNTRIES

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ABSTRACT

Background and Purpose: Online learning has become a new norm to higher education institutions in the developing countries since COVID-19 pandemic. An overnight shift from conventional physical learning to online learning in this pandemic moment has posed a major challenge to most of the educational institutions. Student's readiness and satisfaction towards online learning activities are important to ensure the effectiveness of this new learning method. Therefore, this study aims to examine the online learning readiness and satisfaction among the university students from four Asian countries during COVID-19 pandemic. The domains of the examinations included student learning preference, self- direction, self-efficacy, and hardware-soft skill support.

Methodology: This survey research employed a quantitative approach to gather data. The sample respondents were 1,195 university students from Thailand, Malaysia, Indonesia, and China, selected using a simple random sampling method. Online questionnaires were distributed to the respondents, comprising 37 items including demographic profiles, satisfaction, and online learning readiness

assessment. The survey responses were analysed descriptively and inferentially using the Statistical Package for Social Sciences (SPSS) version 21.0.

Findings: Results showed that 74.7% of the participants had a middle level of online learning readiness, and only 20.1% had high online learning readiness. The levels of online learning readiness varied among the participating countries. The participants lacked online learning preference, as shown in the lower mean scores compared to the means of self-direction, self-efficacy, and hardware-soft skill supports. For satisfaction, students reflected that online course required improvement, as observed in only 31% satisfaction with the online learning courses provided. The results also revealed that there was a significant positive correlation (r=.383) between online learning readiness and students' satisfaction.

Contributions: This study provides preliminary insights into the preparedness of online learning in higher educational institutions in the Asian countries. It implies a potential disruptive impact on the educational system during the pandemic. Such perspectives are crucial for educators to understand students' readiness and perceptions as a means of providing more effective online courses.

Keywords: COVID-19 pandemic, online learning readiness, higher education, satisfaction.

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1.0 INTRODUCTION

Year 2020 is an unprecedented period since the world faced the unexpected disaster known as coronavirus disease 2019 or COVID-19, the largest pandemic ever in human history. The high spreading rate and fatality caused the WHO to officially announced COVID-19 outbreak as a public health emergency of international concern since 30th of January, 2020 (WHO, 2020). In responding to COVID-19 outbreak, WHO also provided the standard recommendations for infection protection and control (WHO, 2020). Following China, shortly, most countries in Asia including Malaysia, Thailand and Indonesia declared the state of emergency and suggested all people to strictly follow WHO's recommendations as well as providing additional guidelines such as wearing masks in public, practicing social distancing in all areas, implementing work from home policy, and staying indoor only in night-time.

COVID-19 has resulted a huge impact to the society including educational sector. To overcome the challenges of teaching and learning activities posted by the outbreak of COVID-

19, higher educational institutions were forced to make almost an immediate change from conventional face to face teaching approach to online learning system. Online learning system is not a new concept in educational sector. Indeed, it has been used in many educational institutions worldwide including in higher educational level prior the pandemic (Palvia et al., 2018).

Xu and Xu (2019) reported that approximately 50% of the higher education institutions in United States had included expanding online learning as a crucial component in formal strategic plans before COVID-19. Almost 70% of the administrators in higher education institutions believed that developing online courses is crucial for the long-term strategy of their institutions (Xu & Xu, 2019). In general, through online learning services, the higher educational institutions can offer numerous online courses to their students regardless of location and time. Studies found that the reasons of students enrolling in online courses included flexibility, convenience with work schedule, preferring work independently, enjoying learning on computer, suitability of the subject areas to the online context, difficulty of the course, and importance of the course (California Community College Chancellor's Office, 2016; Xu & Xu, 2019). Furthermore, in the year 2013 online learning survey carried out by Babson Survey Research Group, revealed that approximately 33% of the higher education students enrolled in at least one online course. The same study indicated that most of the higher education students were likely or very likely to take at least one online course for their degree (Xu & Xu, 2019). You and Kang (2014) noted that for those taking online learning courses, they were likely to be self-regulated learners as well as possessing self-regulated learning skills to utilize time management, regularly review learning materials, seek assistance from professors or peers, meet deadlines, and have the metacognition skill in order to reflect upon their own learning.

Online learning is an approach that allows teaching and learning activities to be conducted in a more innovative and flexible manner. According to Dhawan (2020), online learning is described as a learning experience which involve synchronous and asynchronous using different devices with internet access. Through this platform, student can learn and communicate with trainers and teachers anywhere (Singh & Thurman, 2019). While online learning opens the doors of education to many students who need flexible schedules or have self-regulated learning style, it is essential to recognize the contaminating factors that can make a huge impact on success or failure of online learning. Those factors include self-regulation and motivation, interaction and communication, cultural restrictions, technology skills and access, and accessibility platforms (Gilbert, 2015). However, instead of online learning, most

of the higher educational institutions in the developing countries implement blended learning method owing to their teaching and learning preferences, as well as limitation of internet access in many rural areas (Hanan & Mervat, 2015). In fact, many educational institutions remain traditional learning system because some courses essentially require physical interaction or teachers sometimes do not believe in the effectiveness of online learning system.

Therefore, an overnight shift from conventional physical learning to online learning in this pandemic moment to adapt to new norm, has posed a major challenge of preparedness, both mechanisms and infrastructure, to most educational institutions from the developing countries, hence the worry of the eventual quality of education outcome. There are a number of factors that could lead to the failure of online learning. Notably in developing countries, such factors may differ from the developed countries in the west. These include, but not limited to, low awareness, low computer literacy, unreliable platform and internet services, high cost of implementation, lack of technological devices, difficulty in translating the local language to English in order to cater the online environment, and fear of isolation (Ngampornchai & Adams, 2016). Literature reviews indicated that lack of online teaching experience, low level of self-discipline, poorly preparation, technical difficulties, unequal ICT infrastructure, low self-confidence and direction, are key factors that affect the outcome of online learning during the COVID-19 (Bao, 2020; Bao & Zhang, 2021; Dhawan, 2020; Favale, Soro, Trevisan, Drago, & Mellia, 2020). However, most of these studies focus on students' readiness and satisfaction during the first lockdown period which is the most unprecedented period. The sequelae of this shift have not been appropriately assessed. This paper therefore attempted to identify the level of online learning readiness and satisfaction among the students in higher education institutions in four developing countries post-COVID. This finding of this study will provide further insights to the preparedness of online learning of the higher education institutions in the Asian countries.

2.0 LITERATURE REVIEW

2.1 Online Learning Readiness and Satisfaction

Online learning is the latest model and the most practical solution in education industry during COVID-19 pandemic. It is crucial to support continuation of education during pandemic (Adedoyin & Soykan, 2020; Selvanathan, Hussin, & Azazi, 2020). Students' learning outcomes are the main aspect for education regardless the level of education and the learning mode used. The implementation of online learning during the pandemic is meant to support students' leaning activities thus assuring their academic performance (Zalat, Hamed, & Bolbol,

2021; Elshami et al., 2021). However, information and preparation from institution and lecturer have been insufficient to handle the sudden paradigm shift to online learning mode (She, Ma, Jan, Sharif, & Rahmatpour, 2021). Consequently, the quality of learning and students' academic achievement have become a concern (Sahu, 2020). Course design and pedagogy in online learning (Woodworth et al., 2015) are the possible factors that influence the learning outcomes, and they have a direct impact on students' satisfaction.

Students' satisfaction reflects how they perceive their learning experiences and the quality of the course (Gopal, Singh, & Aggarwal, 2021; Hew, Hu, Qiao, & Tang, 2020). Accessibility issues, technological skills, mental well-being and lecturer commitment have made a significant impact on students' satisfaction and engagement in the online learning system (Ranadewa, Gregory, Boralugoda, Silva, & Jayasuriya, 2021). Additionally, university facilities and quality of the programmes (Weerasinghe & Fernando, 2018), courses content, supportive learning materials, communication and teaching strategies (Ilgaz & Gülbahar, 2015; Patricia, 2020) may also contribute to students' satisfaction. Studies had reported that lecturers' role in preparing the content for the programme, the teaching and learning delivery approach, competencies of lecturer and variety of teaching materials are among the considerations that affect the students' satisfaction.

Students' readiness and willingness to engage the online learning contribute to the level of students' satisfaction (Ranadewa et al., 2021). However, most students were not ready to accept the sudden change of the new learning norm (Zulaikha, Nik Mohd Arif, & Khairuddin, 2020). Students' perceptions towards online learning and their readiness for online learning are attributed to their academic achievement (Adams, Sumintono, Mohamed, & Noor, 2018; Engin, 2017; Mohd Omar, Jusoh, & Adi Kasuma, 2020). Online learning readiness refers to the degree of learners ready to learn via the online environments; online readiness refers to the level of online competency including students' knowledge, activities, and strategies use during online learning (Alem, Plaisent, Zuccaro, & Bernard, 2016). Institutions and educators need to have a better understanding of student's readiness to promote significant learning and outcomes during this pandemic (Pokhrel & Chhetri, 2021).

Numerous factors are known to affect students' online learning readiness, such as internet and technology support, self-efficacy, self-directed learning, online interaction, and learning resources (Adam et al., 2018; Smith, Murphy, & Mahoney, 2003; Wei & Chou, 2020). Online learning requires more responsibility and self-discipline from the students. Basically, there are three main challenges faced by students during online learning: management, learning and technical (Kara, Erdoğdu, Kokoc, & Cagiltay, 2019). These challenges may eventually lead to

mental health problems thus affect the success for online learning (Au, Li, & Wong, 2018; Jiang, Yan-Li, Pamanee, & Sriyanto, 2021). Literatures indicated that students' success in online learning are dependent on their ability to engage in the learning process. Hence, self-regulation and self-direction are believed to the main predictors in the online learning (Hung, 2016; Mohd Omar et al., 2020). Students' online learning readiness are often measured based on several aspects: self-efficacy; institutional support; technical competencies; self-direction; learning preference (Kara et al., 2019; Blankenship & Atkinson, 2010; Hung, Chou, Chen, & Own, 2010; Yilmaz, 2017). Determining students' readiness to online learning education could help the educators to construct an effective online learning approach that supports the students' need hence to students' learning satisfaction. It is a significant aspect to promoting educational processes (Cheon, Reeve, & Vansteenkiste, 2020). Judging the collective rationales, this study provides an overview of online learning readiness and students' satisfaction among the four selected Asian countries: Thailand, Malaysia, China and Indonesia. This study aims to examine the relationship between students' online learning readiness and satisfaction among student from universities in these four countries.

2.2 Online Learning in Thailand

In Thailand, online learning was initiated in 2000 with the project of "Schoolnet Thailand." This project aimed to promote the ability to access online resources of all educational institutions without charge. Under Schoolnet Thailand, several thousands of educational institutions were linked to the Internet network, and numerous online contents and learning materials were used in teaching and learning activities (Laohajaratsang, 2009). The study of Ngampornchai and Adams (2016) explored students' online learning readiness, students' self-regulation, computing devices ownership, and level of familiarity with education-related technologies. The study reported that majority of the students owned personal smartphones (82%), followed by notebook computers (74%), and desktop computer (23%). The findings indicated that students had a slightly positive perception toward online learning, used mobile technologies extensively, and had experience using social media; but were unfamiliar with other collaborative online learning tools. On average, students reported moderate level of self-regulation in online learning (Ngampornchai & Adams, 2016). In Thailand, Laohajaratsang (2009) pointed out that most institutions (93%) already started online learning system and assigned responsible units for online learning services. The study further highlighted that more than 75% of the higher education institutions expressed their readiness to accommodate online learning services for staffs and students. However, progress was rather slow in integrating

online learning into classroom settings because of the resistance of conservative instructors, administrators, and educational personnel. They seemed to be resistant in changing from traditional teaching approach to online learning system even after receiving professional development in online learning training (Laohajaratsang, 2009). On a separate note, Teo, Luan, Thammetar, and Chattiwat (2011) measured online learning acceptance of 377 students at three Thailand public universities in three domains including tutor quality, perceived usefulness, and facilitating conditions, and revealed that the participants had an above average level of online learning acceptance. The study also found that online learning acceptance was significantly positively correlated with perceived competence. Once students acknowledged their technological abilities, they were more positive and confident to use technologies for their study.

2.3 Online Learning in Malaysia

In Malaysia, online learning was introduced and started implementing in higher education institutions in the late 1990s. Today, online learning is listed in the Malaysian Education Blueprint 2015-2025 as one of the main initiatives of Malaysian educational development. The goal is to increase up to 70% of the programmes using online learning as integral component of higher education and lifelong learning. Grapragasem, Krishnan, and Mansor (2014) found that in the academic year of 2011, 11% of the Malaysian higher education institutions offered more than 50% online courses, 13.8% of the lecturers had 80% of teaching materials available online, and 44.6% of the students preferred reading online materials. Although online learning is supportive by the government and acceptable by instructors and students, there are several challenges in the implementation of online learning in Malaysian higher education institutions. Adams et al. (2018) listed factors influencing the readiness of implementing online learning including lack of trained lecturers, facilities and infrastructures, students' preparedness, and students' resistance to adopt online learning and Learning Management System tools. To overcome these challenges, Alias, Zakariah, Ismail, and Aziz (2012) conducted a survey on Malaysian college students and identify 10 elements required for online learning: ease of use, appearance, linkage, structure and layout, information, reliability, efficiency, support, communication and security. Sulaiman (2014) also suggested that video conference should be used while chatting in chat room, and internet facilities should be improved across campus. He further proposed that both suggestions should be applied to all courses and institutions. Interestingly, the study of Narayanan and Selvanathan (2017) found that approximately 84% of the participants had negative impression towards their students in taking online learning

courses. Students felt that some courses are inappropriate for online teaching because these courses required calculations, such as, mathematics, accounting, economics, and statistics. According to the response, it is difficult for students to understand the concepts and contents of those subjects if taught online. In addition to academic concerns, student's campus life is another drawback to online teaching. Online teaching hindered the students from enjoying their lives with friends and regular communications with faculties (Narayanan & Selvanathan, 2017).

2.4 Online Learning in China

In China, the number of internet users is approximately 55.8% of the population, accounting 4.1% greater than the world's average. Among those internet users, 97.5% accessed through mobile data. With the high capacity in accessing to internet, it is an opportunity to expand online learning in higher education institutions in China. In 2000, the Chinese Higher Education Department launched the pilot project of "New Century Online Curriculum Construction" to build about 200 online courses with the support of required network learning resources. Moreover, "National Excellent Courses Construction Project" was launched in 2003 for all undergraduate students, vocational students, online education institutions and other institutions across China. Through governmental support, 3,800 courses were evaluated and approved as national high-quality courses in 2010 and more than 200 well-known universities and colleges participated in the high-quality video open course construction (Lu, Huang, & Ye, 2018). Zhang, Kang, and Li (2019) claimed that personal experience, language, technology, information on course selection, and course certification are the challenging issues for online learning in China. They further clarified that online learner experienced difficulty in conducting online discussion; in other words, offline support is still required. In contrast, Tang and Carr-Chellman (2016) suggested that online learning could enabled learners to apply their scattered time more effectively. Regarding language issues, many online learners experienced language barriers in courses because they were mostly taught in English. The language barriers and unfamiliar accents were thought to have increased difficulty of online courses. In the case of technology, it was considered as bottlenecks of access and speed of internet connection. In fact, course certificates took time in process and required certification by national education policy (Tang & Carr-Chellman, 2016; Zhang et al., 2019).

2.5 Online Learning in Indonesia

The rate for high school graduates pursuing higher education level in Indonesia is low (Santoso, 2018). Therefore, online learning system has been an option to increase the enrolment rate in higher education level. For effectiveness of online learning implementation in Indonesia, Santoso (2018) identified seven opportunities and seven challenges for consideration. The seven opportunities for online learning include: having many potential students for online learning; governmental support through presidential and ministerial regulations; having potential connection to nonformal and formal education; using online learning as promotional tools to attract potential students; using online learning as a tool to improve quality and equity in education; using online learning as a tool to improve professional skills; and low competition in providing online learning in Indonesia. Whereas the seven challenges include: small number of internet users; low rate of digital literacy; unsuccessfulness of legal obligations; time and financial consuming for online learning system development; lacking multidisciplinary knowledge and skills for online learning courses development; limit in using English language; and no mature online learning model in Indonesia (Santoso, 2018).

Studies have attempted to identify the effective strategies to implement online learning systems in students, lecturers, and providers. Astuti, Alexandro, and Purnawarman (2017) examined 500 Indonesian online learners, and revealed that 70.81% of them used cognitive strategies, 72.33% used metacognitive strategies, and 61.83% used resource management strategies. Within cognitive strategies, majority of the online learners used organizational technique (72.89%), followed by critical thinking skill (72.26%), rehearsal technique (71.37%), and elaboration technique (66.21%), respectively.

Among resource management strategies, time and study environment was ranked the highest (75%), followed by management (70.6%), help seeking (66.73%), effort regulation (52.07%), and peer learning (44.76%), respectively. For the investigation of relationship between learning strategies and interaction of learners and instructors, the results demonstrated that the interaction in online courses occurred when the instructor's shared information of the online course. The following activities further indicated the interaction levels: distributing the course syllabus and schedule (81.8%), answering questions (70.68%), and discussing about the assignment and the exams (64.68%). In addition, guidance and facilitating learning, social intimacy, instructional communication, presence of instructors, and instructional support were essential strategies in maintaining relationships between online learners and instructors (Astuti et al., 2017). Pradana and Amir (2016) also found that computer self-efficacy, perceived usefulness, interaction, and social presence simultaneously had significant influence on

effectiveness of online learners. In relation to online learning readiness of students, Nur and Wahyu (2014) examined the online learning readiness of junior high school in Yogyakarta in eight components of readiness including: psychological, sociological, environmental, human resource, technological skill, financial, equipment, and content.

Collectively, there are numerous challenging factors that may influence the implementation of online learning, particularly in developing countries. With COVID-19 pandemic, online learning has become most popular in education industry. In order to provide most effective online learning strategy, a clear picture of online learning readiness of students must be addressed. Therefore, this study aimed to examine the online learning readiness among the higher education students during COVID-19 pandemic. Four domains will be examined, namely, learning preference, self- direction, self-efficacy and hardware-soft skill support. These domains were proposed by previous studies to measure online learning readiness (Blankenship & Atkinson, 2010; Ünal, Alır, & Soydal, 2014). In addition, to broadly understand students' satisfaction on the online learning courses provided by higher education institutions (HEIs), this study has included the participants from four developing countries from Asia namely, Thailand, Malaysia, China and Indonesia. Specifically, the objectives of this study are:

1. To identify the levels of online learning readiness in four domains namely, learning preferences, self-direction, self-efficacy, and hardware-soft skill support.
2. To identify the levels of satisfaction on the online learning courses provided by higher education institution.
3. To examine the differences in online learning readiness among the students of four developing countries.
4. To examine the relationships between online learning readiness and the students' satisfaction on the online learning courses provided by higher education institution.

3.0 METHODOLOGY

3.1 Design and Procedure

This survey research employed a quantitative approach to gather data. A sample of 1,195 higher education students as respondents from four developing countries (Thailand, Malaysia, China and Indonesia) participated in this study. The respondents were selected using a purposive sampling method and the online questionnaires sent via Google Form were distributed to all

the respondents. Prior consent was sought after from the respondents prior to the conduct of the research.

3.2 Research Instrument

The 37 questionnaire items that were developed includes the demographic profiles and online learning readiness assessments. Demographic profile questions were used to collect general information such as gender, educational levels, type of educational institutions, problem using online learning, internet connection stability, internet coverage, as well as satisfaction with online learning courses.

The online learning readiness assessment was the instrument used in this study, and it was adapted from the Online Readiness Assessment by Vicki Williams and the Pennsylvania State University (Blankenship & Atkinson, 2010; Ünal et al., 2014). The assessment comprises four domains, which are learning preference, self-direction, self-efficacy, and hardware-soft skill support. The items were verified by a panel of experts in the field of study from the four countries to ensure the suitability of content, language, understanding, issue of sensitivity and other related matters. In addition, the reliability value of the instrument fulfilled the statistical requirement (Hair, Black, Babin, & Anderson, 2010). All domains of assessment reported reliability value greater than 0.70 as follows: learning preference (0.865), Self-direction (0.863), self-efficacy (0.872), and hardware-soft skill support (0.829).

A 5-point Likert-like scale ranging from 1 (strongly disagree) to 5 (strongly agree) was used in the instrument. A higher score indicates that respondent was more prepared and ready for online learning. In this study, however, three levels of mean score were used to identify the level of readiness. The composite mean was collapsed into three levels with equal intervals for creating an interpretation of the mean score as suggested by Goyal, Singh, Swietlicki, Levin, and Rubin (1998). The three collapsible levels of mean score included low level (1.00-2.32), moderate level (2.33-3.65) and high level (3.65-5.00). In collapsing mean score from five levels to three levels, Pallant, Crook, and Cameron (2010) suggested that it is practical to identify the different levels of assessment scales having five levels.

3.3 Data Analysis

The Statistical Package for Social Sciences (SPSS) version 21.0 was used for data analysis. Descriptive statistics analysis including frequency, percentage, mean, and standard deviation were performed to report the demographic information, while inferential statistics analysis including one-way analysis of variance and Pearson correlation were used to determine the

significant levels of the relationships and differences among the variables. The correlation coefficient measured the strength of the relationships between the two variables (Chua, 2013). The values obtained vary from +1 to -1. While positive number indicates positive correlation, negative number designates negative correlation. The higher value shows stronger correlation between two variables. Chua (2013) clarified that the strength of correlation coefficient values can be interpreted as followed: .90 to 1.00, −.90 to −1.00 = very strong correlation; .70 to .90, −.70 to −.90 = strong correlation; .50 to .70, −.50 to −.70 = moderate correlation; .30 to .50, −.30 to −.50 = weak correlation; .00 to .30, .00 to −.3 = very weak correlation; and .00 = no correlation.

4.0 FINDINGS

4.1 Demographic Information

A pool of 1,195 participants participated in this study including 385 Thai (32.3%), 206 Malaysian (17.2%), 353 Chinese (29.5%), and 251 Indonesian (21%). Among those participants, they were 393 males (32.9%) and 802 females (67.1%). A majority of participants (88.2%) studied in public universities, 10.3% attended in private universities, and 1.5% joined in other institutions. In educational levels of pursuit, 82.3% was undergraduate, 7.7% was in graduate, and 10% was in other programs. For internet coverage, findings reported 1.2% as very poor, 54.7% as moderate, and 4.2% as very strong. Regarding connection stability, 0.3% had no connection, 63.4% could connect but connection remained unstable, and 37.3% reported as stable and excellent connection. Additionally, 519 participants (43.4%) had problems with online learning, while 346 participants (29%) did not, and 330 participants (27.6%) occasionally had problems.

Table 1: Demographic information.

Item	**Frequency (%)**		**Frequency (%)**
Country		Internet Coverage	
Thailand	385 (32.3%)	Very Poor	14 (1.2%)
Malaysia	206 (17.2%)	Poor	95 (7.9%)
China	353 (29.5%)	Moderate	654 (54.7%)
Indonesia	251 (21%)	Strong	382 (32%)
		Very Strong	50 (4.2%)
Gender			
Male	393 (32.9%)	Connection Stability	
Female	802 (67.1%)	No Connection	4 (0.3%)
		Connection but Unstable	344 (28.8%)
Higher Institution		Average (on and off)	401 (33.6%)
Private	123 (10.3%)	Stable	376 (31.5%)
Public	1054 (88.2%)	Excellent	70 (5.8%)
Others	18 (1.5%)		
		Problem (Online Learning)	
Education (current)		Yes	519 (43.4%)
Diploma/Foundation	100 (8.4%)	No	346 (29%)
Bachelor	984 (82.3%)	Maybe	330 (27.6%)
Master	52 (4.4%)		
PhD	39 (3.3%)		
Others	20 (1.6%)		

(N=1,195)

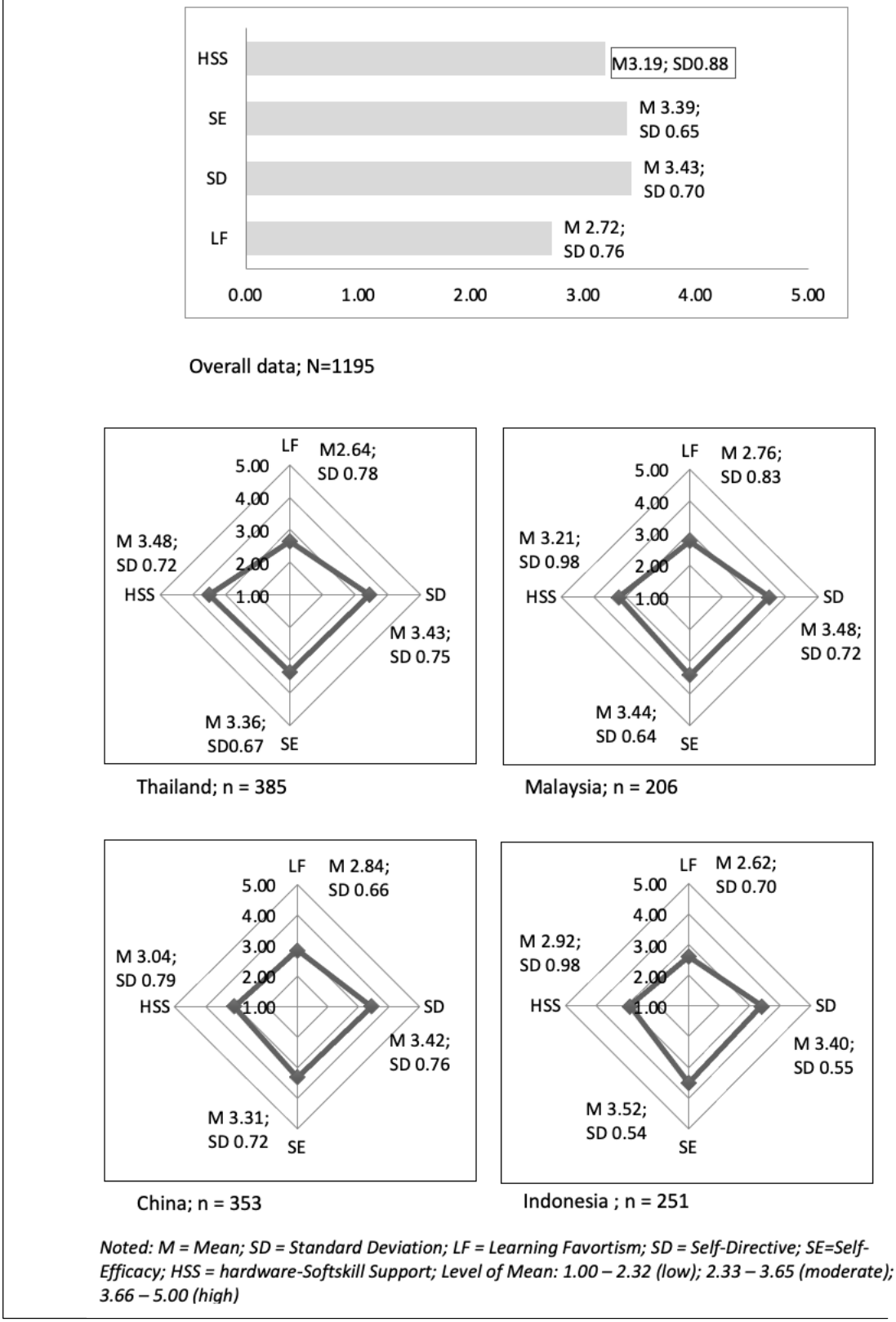
4.2 Online Learning Readiness

The test for online learning readiness included four domains, namely learning preferences, self-direction, self-efficacy, and hardware-soft skill support. Overall, most participants (74.7%) reported as having moderate level of online learning readiness. There were 20.1% of the participants indicated as having high level of online learning readiness, and only 5.2% had low level of online learning readiness. Table 2 shows the frequency and percentage of the participants in each domain of each country.

Table 2: Frequency and percentage of online learning readiness

	Domain	**Low**	**Middle**	**High**
		Frequency (%)	**Frequency (%)**	**Frequency (%)**
Thailand	Learning Preference	128 (33.2%)	205 (53.3%)	52 (13.5%)
n=385	Self-Direction	31 (8.1%)	201 (52,2%)	153 (39.7%)
	Self-Efficacy	24 (6.2%)	233 (60.5%)	128 (33.3%)
	Hardware-Soft skill Support	21 (5.5%)	194 (50.3%)	170 (44.2%)
China	Learning Preference	60 (17%)	245 (69.4%)	48 (13.6%)
n=353	Self-Direction	27 (7.7%)	187 (53%)	139 (39.3%)
	Self-Efficacy	28 (7.9%)	212 (60.1%)	113 (32%)
	Hardware-Soft skill Support	59 (16.7%)	210 (59.5%)	84 (23.8%)
Malaysia	Learning Preference	57 (27.7%)	116 (56.3%)	33 (16%)
n=206	Self-Direction	11(5.3%)	119 (57.8%)	76 (36.9%)
	Self-Efficacy	8 (3.8%)	119 (57.8%)	79 (38.4%)
	Hardware-Soft skill Support	32 (15.6%)	101 (49%)	73 (35.4)
Indonesia	Learning Preference	72 (28.7%)	163 (65%)	16 (6.3%)
n=251	Self-Direction	5 (2%)	176 (70%)	70 (28%)
	Self-Efficacy	4 (1.6%)	144 (57.4%)	103 (41%)
	Hardware-Soft skill Support	56 (22.3%)	132 (52.6%)	63 (25.1%)

Considering the mean score of online learning readiness, the participants had moderate level of online learning readiness (mean score between 2.72 – 3.43 in all domains). As depicted in Figure 1, the participants from four countries perceived themselves only at the level of moderate readiness in online learning during COVID-19 pandemic. Among the four domains, the participants reported lack of learning preference with the mean score slightly lower than their self-direction, self-efficacy and hardware-soft skill support. Figure 1 shows the details of the mean scores in all domains of four countries.



Noted: M = Mean; SD = Standard Deviation; LF = Learning Favortism; SD = Self-Directive; SE=Self-Efficacy; HSS = hardware-Softskill Support; Level of Mean: 1.00 – 2.32 (low); 2.33 – 3.65 (moderate); 3.66 – 5.00 (high)

Figure 1: Mean and standard deviation of online learning readiness

4.3 Students' Satisfactions in Online Learning Courses

The findings indicated that overall, only 368 (31%) participants were satisfied with their online

learning courses provided by the respective higher education institutions. More than 60% of the participants did not satisfy with their online learning courses. As shown in Figure 2, 55.4% of the Indonesian students reported unsatisfied with their online learning courses while 33.7% of the Chinese students felt satisfied with their online learning courses. More than 40% of the Thai, Malaysian and Chinese students reported neutral, i.e., neither satisfy nor unsatisfied.

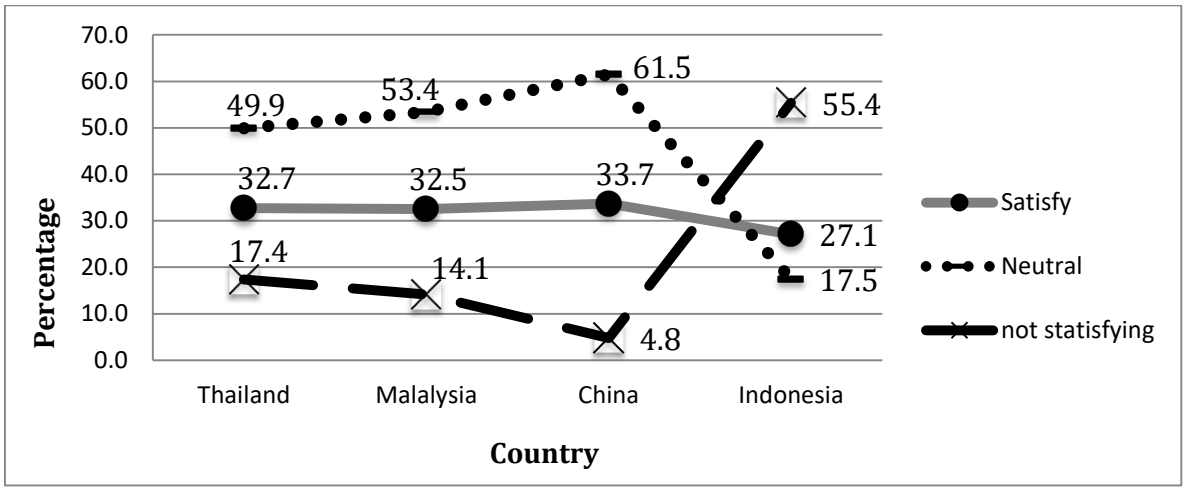


Figure 2: Students satisfactions towards online learning courses

4.4 The Differences of Students' Online Learning Readiness

One-Way ANOVA was conducted to compare the levels of students' online learning readiness among four countries with the significant level of .05. The results revealed a statistically significant difference in online learning readiness among four countries, $F(3,1191) = 254.14$, $p < .05$. Despite reaching statistical significance, the actual difference in mean scores between groups was considered as medium effect (Cohen, 1998). The effect size, calculated by eta squared, was .39. Post hoc comparisons by Tukey HSD were further performed to observe the differences among four countries. The results indicated that the mean score of Malaysia (M=57.83, SD = 11.32) was significantly different from Thailand (M=91.24, SD = 15.99); China (M=88.13, SD = 17.18); and Indonesia (M=90.19, SD = 13.77). The mean score of Thailand was also significantly different from China. However, Indonesia did not differ significantly from Thailand and China. Among four domains of readiness, there were significant differences in online learning readiness [learning preference $F(3,1191) = 5.82$, $p = .00$; self-efficacy $F(3,1191) = 5.45$, $p = .01$; hardware-soft skill support $F(3,1191) = 26.08$, $p = .00$] except self-direction as further demonstrated in Table 3.

Table 3: The differences in online learning readiness among four countries.

Overall	**Source**	**df**	**SS**	**MS**	**F**	**p**
Online Learning Readiness	Between Group	3	176689.87	58896.62	254.14	.000
	Within Group	1191	276010.82	231.74		
	Total	1194	452700.70			

Domain	**Source**	**df**	**SS**	**MS**	**F**	**p**
Learning Preference	Between Group	3	366.54	122.18	5.82	.001
	Within Group	1191	24974.15	20.96		
	Total	1194	284378.24			
Self-Direction	Between Group	3	16.674	5.55	.44	.719
	Within Group	1191	14767.68	12.39		
	Total	1194	14784.36			
Self-Efficacy	Between Group	3	452.22	150.74	5.45	.001
	Within Group	1191	32899.96	27.62		
	Total	1194	33352.18			
Hardware-Soft skill Support	Between Group	3	3313.09	1104.36	26.08	.000
	Within Group	1191	50430.31	42.34		
	Total	1194	53743.41			

4.5 The Relationships between Students' Online Learning Readiness and Students' Satisfactions on Online Learning Courses Provided by Higher Education Institution

Pearson product-moment correlation test was used to determine the relationships between students' online learning readiness and their satisfactions on online courses provided by higher education institutions. As presented in Table 4, significant positive correlation ($r=.383$; $p < .01$) was observed between the total value of online learning readiness and student's satisfactions. According to Chua (2013), the levels of correlation between 0.30 – 0.50 indicates weak positive correlation. The findings reported that all domains for online learning readiness were significantly positively correlated with students' satisfactions (correlation level between 0.356 – 0.515). Among the four domains, student's learning preference was reported as the highest correlation level with online satisfaction ($r=.515$; moderate correlation); while the lowest correlation level was reported between hardware-soft skills support and online satisfaction ($r=.338$; weak correlation).

Table 4: Correlation analysis

		1
1	Satisfaction	-
2	Overall Readiness	.383**
3	Learning Preference	.515**
4	Self-Directive	.356**
5	Self-Efficacy	.372**
6	Hardware-Soft skills Support	.338**

**correlation is significant at the 0.01 level (2-tailed)

5.0 DISCUSSION

This study assessed the online learning readiness of higher education students during COVID-19 pandemic in four Asian countries: Thailand, Malaysia, Indonesia and China, based on four primary domains namely learning preference, self-direction, self-efficacy and hardware-soft skill support. A total of 1,195 higher educational students were enrolled in this study. Overall, majority of the participants (74.7%) had moderate level of online learning readiness. Notably in Thailand, the finding was contradicting with the previous study by Teo et al. (2011) which indicated that students had an above average level of online learning acceptance. Similarly in Indonesia, our finding also demonstrated a contradiction with the study findings by Waryanto and Setyaningrum (2014), that signified a fairly high readiness for online learning of students. Nonetheless in Malaysia, our finding is consistent with those reported by the previous study (Mohd Omar et al., 2020) that students were ready in the use of technology, and were confident in online learning during the pandemic Additionally, students with moderate readiness may positively change their perceptions on instructors in using online learning systems (Narayanan & Selvanathan, 2017). By looking at the domains of readiness, it was interestingly found that the students had lower scores in learning preference than other domains, which may imply that online courses were not as attractive, useful, or effective as anticipated. The possible factors affecting lack of learning preference have been discussed in the literature including self-regulation and motivation, interaction and communication, cultural restrictions, technology skills and access, and accessibility platforms (Adams et al., 2018; Gilbert, 2015; Ngampornchai & Adams, 2016; Zhang et al., 2019).

Regarding students' satisfactions in online learning courses, our study revealed that more than 60% of the students were not satisfied with their online learning courses. By further discovering the relationships between students' online learning readiness and their satisfactions on the online courses, it was found that all domains of online learning readiness were

significantly positively correlated with students' satisfactions. As discussed in the literature, the factors that may influence students' satisfaction levels include insufficient knowledge and skills of instructors in creating effective online learning courses, instructional communication and support, and inadequate support of facilities, equipment, and infrastructures (Adams et al., 2018; Astuti et al., 2017; Laohajaratsang, 2009). Universities are recommended to provide more workshops and better platforms for educators in designing attractive and effective online lesson plans (Zulaikha et al., 2020). Although students' satisfactions and online learning readiness are influenced by numerous factors, the instructors, who are responsible to create online learning courses, should be taken into consideration as a core component for future improvement of online learning system. Bao (2020) suggested six instructional strategies in her study to improve students' learning concentration and engagement to secure success for online learning, such as dividing teaching content into smaller units to assist students understanding, or emphasizing the use of voice during teaching and learning process to attract student attention. As widely known, online learning has been popular, particularly in higher education institutions. The improvement of the entire online learning systems will lead to the readiness and satisfactions of students and staff. This study is essential for higher education institutions and governments to review their policies and practices in improving online learning systems in the near future.

6.0 CONCLUSION AND RECOMMENDATION

Online learning has started operation since 1990s and expanded across the four participating countries with the support of the governments. Online learning is believed to be an excellent tool in opening educational opportunities to students regardless of time and location. This study evaluated the readiness and satisfactions of higher education students taking online courses, to observe the differences of readiness among students from the four participating countries, and to determine the relationships between online learning readiness and students' satisfactions on online learning courses. The participation of 1,195 students from four countries namely, Thailand, Malaysia, Indonesia and China revealed that majority of the higher education students were ready for online learning. Within the domains of readiness, all students agreed that online learning is not their preferential learning approach, provided they have good self-direction, self-efficacy and hardware-soft skill. However, our findings indicated that more than 60% of the participants were unsatisfied in online learning courses. Therefore, online learning needs further improvements. In addition, the students are more likely to be ready for online learning once their satisfactions on online learning are increasing. The collective findings

implied that online learning readiness and satisfaction on online learning are the keys for examining the success of online learning systems.

The present study reports not only the current situation of online learning readiness and students' satisfactions during COVID-19 pandemic, but also presents a valuable insight for the academia in the developing countries in exploring the achievement of online learning during the unexpected pandemic situation. Motivation and encouragement are required to remind our generation to recognize the benefits of online learning with the development of industrial revolution 4.0. Policy makers in higher education institutions should prepare a comprehensive guideline, not only focusing on teaching and learning strategies, but also highlighting other academic issues such as online assignments, online activities and online examinations to maximize the use of online learning systems and increase the effectiveness. Online learning is a successful key for future education and country development. Therefore, governmental supports are important especially in developing countries. Importantly, establishing infrastructure, professional training, and financial support are crucial to ensure the success of online education.

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