

A Comparative Study of Students' Readiness on E-learning Education between Indonesia and Myanmar

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Abstract

Due to the popularity of internet, e-learning is becoming more and more popular in not only developed countries but also developing countries. The integration of e-learning at the academic environment of the developing countries was not easy if compared to the developed countries. The inexperienced-universities which are trying to implement e-learning should learn how to overcome challenges and how to make academic strategies from the experienced-universities in e-learning. The purpose of this study was to measure e-learning readiness of two universities from ASEAN(the Association of Southeast Asian Nations) developing countries. In order to adopt e-learning education successfully into Myanmar's traditional higher education, the findings of this study seek the possible drivers and barriers found in the students from Yangon Technological University (YTU), Myanmar and pointed out what kind of requirements should be upgraded in YTU by comparing Indonesia's e-learning education. The results could provide YTU to get information that their students' readiness was over the expected level, except in the learning environment and facilities related to YTU. Additionally, the readiness results from YTU in turn encourage Sam Ratulangi University(UNSRAT),Indonesia so that it could make a check-up on its current e-learning strategies and resources in line with the students' requirements. The findings indicated that UNSRAT's facilities were also under the expected level although it was running e-learning courses. Moreover, the findings from this study would be helpful for the universities from not only Indonesia and Myanmar but also other developing countries in order to ensure the effective adoption of e-learning.

Keywords: E-learning readiness; Indonesia; Myanmar; UNSRAT; YTU; Students.

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1. Introduction

In today's educational society, e-learning is an attractive option due to its no-limitation of time and place. The emergence and evaluation of internet have taken a great opportunity for the universities in the developing countries to develop unlimited learning. So, many developing countries have expressed an interest to implement e-learning but they have the obstacles in their infrastructure, resources, information access and personal characteristics, support from institution, technology and connectivity, instructors' design and technology confidence, as well as culture and policy [1,2]. In addition, they have to face more unique challenges than developed countries and hence, they must understand what drives learners towards e-learning education. Besides, different learning groups, different nations and populations might have different ways of responding to knowledge-oriented initiatives [3]. Therefore, e-readiness studies have to take into account the particular influences upon each situation, institution or learning programme. Although different factors affect the implementation and effectiveness of e-learning, but the readiness is the critical success factor [4]. Moreover, e-learning readiness involves many components of e-learning including students, lecturers, technology and the environment, which must be ready in order to formulate a coherent and achievable strategy.

Furthermore, the known levels of e-learning readiness could assist educational stakeholders so that they could plan and adjust the resources. Besides, the national government could formulate strategies to address its readiness related challenges and to promote its academic quality. Because e-readiness assessment is a useful tool for determining a country's education development and can be considered as an initial phase of the national strategy in the ICT-based sectors. Moreover, unless e-learning readiness level was established and corrective measures were taken, all the efforts and investments in implementing e-learning were likely to be fruitless. And the universities which want to implement e-learning should also learn the experiences of other universities which were currently running e-learning education and were familiar how to solve similar challenges even though they could have unique barriers. This paper examined a comparative study on the e-learning readiness of the students from Yangon Technological University, the Republic of the Union of Myanmar with the students from the Sam Ratulangi University(UNSRAT), the Republic of Indonesia. Depending on the attitudes of their students, the readiness levels of two universities were measured. Furthermore, this research would like to investigate difference among two universities. The remainders of this paper were structured as follow. First, it would describe the background of higher education and universities participated in this study. Second, it would present the methodology including the design of readiness dimensions, participants and instruments. Finally, it would compare the students' readiness, indicate their differences, and then conclude their readiness levels together with the drivers and barriers towards e-learning education.

2. Background of Higher Education

Both the Republic of Indonesia and the Republic of the Union of Myanmar are located in Southeast Asia and are also the members of ASEAN countries. Indonesia is also the world largest island country and Myanmar is also the second largest landmass in Southeast Asia. With population of 261.989 million, Indonesia is also the highest population and the first of GDP among ASEAN countries. Myanmar has a population of 52.645 million and its GDP is ranked at the seven [5]. According to 2017 Human Development Index(HDI) which put education as

one of its three indicators[6], Indonesia was remarked at 113 among 188 countries and Myanmar's HDI was ranked at 145. Both Indonesia and Myanmar were still far behind the other ASEAN countries, namely Singapore (5), Brunei Darussalam (30), Malaysia (59), and Thailand (87). So, both countries have to focus on their young generation for becoming formidable and competitive human resources.

Since last decade, higher education institutions in Indonesia had increased the use of e-learning rapidly and at present, many Indonesia universities were providing e-learning and blended-learning courses to complement their classroom-based courses. However, to get better successes of e-learning education, universities in Indonesia were still facing some obstacles. Nawang Sari Adhiyanti Muljo Kusumo and his colleagues presented that in particular, the major obstacles faced by Indonesian students in e-learning education were the low independent study (65.52%), connection problem(58.62%), and lack of familiar with online materials (48.28%)[7].

In Myanmar, e-learning education is still on the early stage. Its universities are facing challenges to implement e-learning within their limited resources. Soe Soe Khaing et al. reported that most of teachers and students in academic environment assumed wrongly that e-learning is not cost effective even though it can take better educational chances[8]. Currently, the Myanmar is trying to reform its higher education so that its universities can provide an inclusive education for lifelong learning by 2030. Moreover, Myanmar could potentially learn from the experience of other countries who are also exploring greater use of ICT [9]. However, if compared to other ASEAN countries, it could be clearly seen that the expenditure for the education in Myanmar was significantly low and its technology education system was also lack opportunities to provide the students in accessing the qualified educational resources [10]. In other words, it was due to a digital divide between ASEAN developing countries. So, in this study, the difference of e-learning readiness between two developing countries from ASEAN was considered. However, internet users of Indonesia were 25.37 % of population while Myanmar reached to 25.07% [11]. It showed there was not a huge difference on internet users between two countries and a good opportunity for Myanmar to implement internet-based education like Indonesia. On related to this issue, Myanmar students' e-learning readiness was measured in comparison to the students from Indonesia.

3. Background of Universities

Sam Ratulangi University(UNSRAT), a state university in Manado, North Sulawesi, Indonesia, was established on September 14, 1965[12]. UNSRAT made serious efforts to extend Information and Communications Technology (ICT) network for its students and it searched for the most effective method to integrate e-learning into their curriculum. Moreover, UNSRAT joined together with the Sriwijaya University(UNSRI) and Musamus Merauke University(MUSAMUS) in implementation of e-learning lectures conducted by Sepuluh Nopember Institute of Technology(ITS) and the numbers of students enrolled in those lectures were very high too[13]. From the blended learning courses established since 2011 at the Department of Electrical Engineering under the Faculty of Engineering, a positive effect on increasing students' performance and their raising exam pass-rates were found[14]. Based on the published data in 2015, UNSRAT had 25259 students and 1725 lecturers including professors who were serving at the 57 departments under of 11 facilities[15].

Yangon Technological University (YTU) is located in Gyogone, Yangon, is the premier engineering university of Myanmar which was established as the Department of Engineering under Rangoon University in 1924. The department was upgraded and renamed as the Faculty of Engineering in 1964, as Rangoon Institute of Technology (RIT) in 1963 and as Yangon Technological University (YTU) in 1998. YTU is also the country's oldest and largest engineering university and at the same time, it is also the best engineering university in Myanmar. In December 2012, YTU was earmarked as the Center of Excellence (COE). In Myanmar, the COE universities were targeted to be started quality scientific and technical training programs with the aids of improved methods and well-trained teachers. Moreover, those COE universities were aimed to catch up the standard of ASEAN universities. Until 2014, 527 Ph.D degree holders, 2556 Master degree holders, 1041 Postgraduate Diploma holders, 20901 Bachelor degree holders graduated from YTU and it had 1426 students including 845 undergraduate students, 258 teachers including professors under the 20 departments and 8 faculties[16]. But in 2018, its structure was organized by 12 engineering departments and 6 supporting departments[17]. Like other Myanmar universities, YTU was interested in e-learning education and some of its professors and teachers were experienced in e-learning trainings provided by oversea universities and Ministry of Education. Currently, YTU joined with other national universities such as University of Technology, Yatanarpon Cyber City(UT-YCC) and University of Information Technology(UIT) which were the members of Asean Cyber University(ACU)-Project. The UT-YCC and UIT were also developing e-learning contents under Busan Digital University Project supported by the Korea Education and Research Information Service(KERIS)[8,18]. On related to this, the members from YTU and other universities were joined and trained by UT-YCC in establishment of e-learning content development and e-learning workshops [19]. However, until 2018 any e-learning course was not delivered by YTU themselves. So, the drivers and barriers on the way of e-learning education should be checked before any actual e-learning implementation at YTU.

4. Methodology

4.1. E-learning Readiness

In general, the integration of new technologies into the higher education takes new challenges and opportunities to all participants including students. Therefore, it is very important to assess learners' behaviors and accommodate e-learning strategies to fit with the requirements of learners. As e-learning is a student-centered learning, its main paradigm is to shift the learners' learning activities toward active mode from passive participation. So, the students were becoming the key players as the learners in academic e-learning environment and their e-learning readiness should be clearly assessed. E-learning readiness was defined as "the mental or physical preparedness of an organization for some e-learning experience or action"[20]. In other word, e-learning readiness could provide universities to design e-learning strategies comprehensively and to implement its goals effectively [21]. To start e-learning education, the learners need to be "e-ready" so that a coherent achievable strategy may be implemented [3] and many researchers developed a variety of readiness models. In our study, to evaluate Myanmar students' readiness and to compare it with Indonesia students' readiness, a total of seven indicators were applied and the readiness model was designed. Based on the responses of students, the readiness level of universities was measured. As shown in Figure 1, the design of e-learning readiness was included the followings;

- **Learning Environment(LE):** The e-learning environment becomes more complicated than the classroom-based learning environment, because it is conducted using the internet. Shamaki Timothy Ado (2015) said that intelligence is not the only determinant of academic achievement of students but learning environment is an essential key factor in both online and offline [22]. In the establishment of e-learning education, a central role is to identify a learning environment which equip with the skills and recourse of students so that they can access learning opportunities and share knowledge at their desired time and place. That's why learning environment of students from YTU and UNSRAT was also compared.
- **Lecturer's Roles (LR):** In shifting towards digital-based education, the teachers or lecturers need to acquire all the technical and pedagogical skills that enable them to integrate digital technology effectively and efficiently into their teaching processes. Teachers can guide and engage students into e-learning more smoothly. In our case, students' options toward their teachers'-learning readiness was also measured.
- **University's Facilities (UF):** Understanding university's facilities and management of these facilities play an important role to achieve university's educational goals [23]. Because the students' decisions could be influenced by the university's facilities [24]. Generally, the universities from the developing countries have not enough facilities but most of them adopted e-learning education well within their limited resources. Because they hoped the advantages given by e-learning which is cost-effective and can reduce the gap of inequality. However, before implementing e-learning, every universities should be taken into account to check their actual facilities. And so, YTU's facilities were considered to compare with UNSRAT.
- **Learners' Background (LB):** Napaporn Srichanyachon (2010) pointed out that the ownership of computer and computer usage in concerning educational purpose had a significant relationship with students' opinion toward e-learning [25]. So, the universities need to check the educational characteristics of students and analyses them so that they can design effective e-learning system based on learners' preferences. To determine if the YTU students were consistent with features of e-learning, they were compared to the backgrounds of UNSRAT students.
- **Possible E-learning Benefits(PEB):** The effectiveness of e-learning might be different for students in different countries and perceptions of its effectives might be different[26]. Despite of several advantages of e-learning, it would not be meaningful if the leaners don't know. In this study, attitudes of students on e-learning benefits were considered and their difference was measured. Because the participants from UNSRAT had taken e-learning courses, but the YTU students had no prior e-learning experience.
- **Learners' Future Wishes(LFW):** The attitude is inner feeling or belief of an individual towards particular phenomena and hence, the students' attitudes are important to reflect where they are favorably or unfavorably pre-disposed towards teaching and learning phenomena. As one of readiness indicators, their future wishes should be assessed to know where they are willing to apply online-based education into their traditional teaching and learning.
- **Confidence in Readiness(CR):** This part was organized to know confidence of students on their overall readiness and their university's readiness to implement e-learning. If they have enough self-confidence,

they might be eager to access e-learning materials. Their self-confidence was also inserted into the indicators in order to know where they were willing to access and explore new opportunities for changing their learning with the aid of e-education.

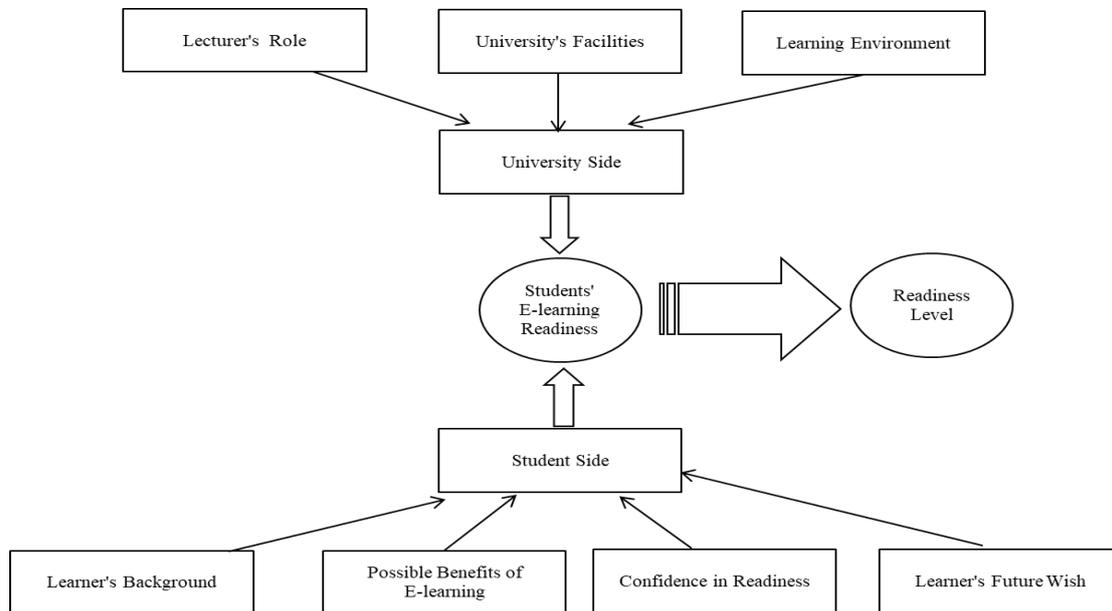


Figure 1: Design of Students' E-learning Readiness Model

4.2. Participants

In this study, 326 students from YTU and 169 students from UNSRAT participated. All the YTU participants from a variety of departments and academic year were remarked as the students from YTU. The participants from UNSRAT were the students who took e-learning class from Information Technology (IT) concentration at Electrical Engineering Department, Faculty of Engineering [14]. In other words, UNSRAT group had enough e-learning experiences provided by their universities but YTU group had no any e-learning experience.

4.3. Instruments

The data collection method used in this research was a quantitative study designed to seek input from students or learners who were able to judge their e-learning readiness. The samples from UNSRAT were obtained from data studied and published by Sary and his colleagues [14] which collected in the end of first semester of academic year 2014 as paper-based assessment. Unlike the study of Sary and his colleagues the readiness level of UNSRAT was also measured in this study and was compared to YTU's readiness. In YTU side, paper-based responses of participants were also collected in January, 2017. For the validity and consistency, the same questionnaires shared in UNSRAT were adopted in YTU's readiness assessment too. Descriptive statistics was applied to measure each item generated by seven dimensions of questionnaires. Independent t-test was also conducted to test if two student groups with different sample sizes were different or not. The significance was considered statistically at the 0.05 level. Moreover, the readiness levels of two groups were evaluated in line with the expected readiness which was defined by Cengiz Hakan Aydın and Deniz Tasci [27].

5. Results

Table 1: Statistics of Learning Environment

Item No.	Learning Environment	UNSRAT(Indonesia)			YTU(Myanmar)			Difference	SD. Error	95% of CI		t-statistic	p-value
		% of SA & A	M	SD	% of SA & A	M	SD			Lower	Upper		
LE1	Colleagues'e-learning knowledge	82.25	4.02	0.84	86.27	3.34	0.84	0.68	0.08	0.84	0.52	8.54	0.0001
LE2	Colleagues' IT competency	76.92	3.98	0.77	80.90	3.12	0.79	0.86	0.07	1.01	0.71	11.58	0.0001
LE3	Colleages'shared vision	60.36	3.69	0.88	64.05	3.00	0.83	0.69	0.08	0.85	0.53	8.59	0.0001
LE4	University's sharing and teamwork culture	79.29	4.00	0.78	83.29	3.51	0.89	0.49	0.08	0.65	0.33	6.05	0.0001
LE5	Discussion via internet	70.41	3.86	0.88	74.27	3.43	0.86	0.43	0.08	0.59	0.27	5.23	0.0001

5.1. Learning Environment

The students from UNSRAT and YTU were significant difference in all the items of learning environment. In e-learning knowledge(LE1), IT competency(LE2), behavior of shared vision(LE3), culture of teamwork (LE4), online discussion(LE5), the UNSRAT students replied higher means than the YTU students. According to those results in the Table 1, it could be said that the Indonesia students had better learning environment if compared to the Myanmar students.

Table 2: Statistics of Lecturer's Role

Item No.	Lecturer's Role	UNSRAT(Indonesia)			YTU(Myanmar)			Difference	SD. Error	95% of CI		t-statistic	p-value
		% of SA & A	M	SD	% of SA & A	M	SD			Lower	Upper		
LR1	Lecturers'readiness	79.29	4.05	0.76	83.34	3.21	0.87	0.84	0.08	1.00	0.68	10.62	0.0001
LR2	Effectiveness of face-to-face	18.93	2.56	1.13	21.49	3.73	0.87	1.17	0.09	0.99	1.35	12.77	0.0001
LR3	Lecturers'role in infomation providing	82.84	3.95	0.95	86.79	3.75	0.85	0.20	0.08	0.36	0.04	2.38	0.0175
LR4	Personal touch's importance in e-leaming process	76.92	4.03	0.75	80.95	3.88	0.70	0.15	0.07	0.28	0.02	2.21	0.0279

5.2. Lecturer's Role

In considering students' option on theirs lecturers, the findings from Table 2 showed that the significant differences between UNSRAT and YTU students existed in all items from LR1 to LR4. Besides, mean value of UNSRAT said that they had higher positive attitudes than YTU students.

Table 3: Statistics of University's Facilities

Item No.	University's Facilities	UNSRAT(Indonesia)			YTU(Myanmar)			Difference	SD. Error	95% of CI		t-statistic	p-value
		% of SA & A	M	SD	% of SA & A	M	SD			Lower	Upper		
UF1	Departments'number of computers	14.79	2.50	1.06	17.29	3.06	1.09	0.56	0.10	0.36	0.76	5.47	0.0001
UF2	Computers'quality is good	59.17	3.54	1.10	62.71	2.87	1.02	0.67	0.10	0.87	0.47	6.75	0.0001
UF3	University network is fast	75.74	3.92	0.95	79.66	2.27	1.08	1.65	0.10	1.84	1.46	16.78	0.0001
UF4	University's IT infrastructure	55.03	3.54	1.04	58.57	3.00	0.91	0.54	0.09	0.72	0.36	5.96	0.0001

5.3. University's Facilities

In Table 3, the educational facilities supported by universities in Indonesia and Myanmar were significant difference. Result of UF1 displayed that the YTU departments had enough computers. But their students'

responses were significant low in computers' quality (UF2) and university's network speed(UF3) than UNSRAT. The finding on UF4 indicated that until 2017, YTU's IT infrastructure was not good like UNSRAT.

Table 4: Statistics of Learner's Background

Item No.	Learner's Background	UNSRAT(Indonesia)			YTU(Myanmar)			Difference	SD. Error	95% of CI		t-statistic	p-value
		% of SA & A	M	SD	% of SA & A	M	SD			Lower	Upper		
LB1	E-learning knowledge	78.11	3.84	1.06	81.95	3.72	0.80	0.12	0.09	0.29	0.05	1.41	0.1588
LB2	Have enough IT competency	81.07	3.95	0.85	85.02	3.32	0.89	0.63	0.08	0.79	0.47	7.58	0.0001
LB3	Use computer at home	87.57	4.20	0.79	91.77	3.90	1.00	0.30	0.09	0.47	0.13	3.39	0.0008
LB4	Use computer at campus	79.88	4.05	0.76	83.93	3.20	1.07	0.85	0.09	1.03	0.67	9.19	0.0001
LB5	Discipline myself to follow e-learning courses	60.36	3.64	0.88	64.00	3.79	0.71	0.15	0.07	0.01	0.29	2.05	0.0409
LB6	Own personal computer/laptop	66.86	3.78	0.93	70.64	4.18	0.93	0.40	0.09	0.23	0.57	4.54	0.0001

5.4. Learner's Background

Amazingly, as shown in Table 4, e-learning knowledge of two student groups was the same at LB1. Although the YTU students had no experience, they showed that they were not significant different. But their IT competency(LB2), their computer use at home (LB3) and at campus(LB4), they were still low to catch up the UNSRAT's students. But due to mean values, they are higher than UNSRAT in personal management (LB5) and their computer/laptop ownership(LB6).

Table 5: Statistics of Learner's Future Wishes

Item No.	Learner's Future Wishes	UNSRAT(Indonesia)			YTU(Myanmar)			Difference	SD. Error	95% of CI		t-statistic	p-value
		% of SA & A	M	SD	% of SA & A	M	SD			Lower	Upper		
LFW1	Ready to integrate	73.96	3.82	1.10	77.78	3.90	0.79	0.08	0.09	0.09	0.25	0.93	0.3529
LFW2	Perfer e-learning lessons	81.66	4.02	0.82	85.68	3.52	0.82	0.50	0.08	0.65	0.35	6.43	0.0001
LFW3	Willing to make time for e-learning	75.74	3.94	0.75	79.68	3.94	0.72	0.00	0.07	0.14	0.14	0.00	1
LFW4	Improve work performance	82.84	4.11	0.66	86.95	4.11	0.63	0.00	0.06	0.12	0.12	0.00	1

5.5. Learner's Future Wishes

According to the p-values found in LFW1, LFW3 and LFW4 from Table 5, both student groups had the same wishes. They were willing to integrate e-learning and make time for it and improve their work performance through e-learning. On LFW2, the students from UNSEAT were more preferred e-learning lessons than YTU students. It might be due to their practical experience with e-learning lessons supported by UNSRAT.

Table 6: Statistics of Possible Benefits of E-learning

Item No.	Possible Benefits of E-learning	UNSRAT(Indonesia)			YTU(Myanmar)			Difference	SD. Error	95% of CI		t-statistic	p-value
		% of SA & A	M	SD	% of SA & A	M	SD			Lower	Upper		
PBE1	E-learning's advanced mode in teaching and learning	63.91	3.71	0.86	67.62	3.99	0.64	0.28	0.07	0.15	0.41	4.09	0.0001
PBE2	E-learning's efficeine of disseminating information	74.56	3.96	0.72	78.52	3.98	0.65	0.02	0.06	0.11	0.15	0.31	0.7546
PBE3	E-learning's improvement for teaching and learning	85.21	4.14	0.66	89.35	3.92	0.69	0.22	0.06	0.35	0.09	3.41	0.0007
PBE4	E-learning's opportunities	72.78	3.93	0.74	76.71	4.04	0.66	0.11	0.07	0.02	0.24	1.69	0.0924

5.6. Possible Benefits of E-learning

Unlike other dimension, the YTU students replied higher means on three items of Table 6; PBE1, PBE2 and PBE4. As significant point of view, their attitudes in e-learning’s advanced mode(PBE1) and its improvement (PBE3) were different. In e-learning’s efficiency(PBE2) and its opportunities(PBE4), Myanmar students are not significant difference with Indonesia students.

Table 7: Statistics of Confidence in Readiness

Item No.	Confidence in Readiness	UNSRAT(Indonesia)			YTU(Myanmar)			Difference	SD. Error	95% of CI		t-statistic	p-value
		% of SA & A	M	SD	% of SA & A	M	SD			Lower	Upper		
CR1	I am ready	81.07	4.04	0.66	85.11	3.85	0.72	0.19	0.07	0.32	0.06	2.86	0.0044
CR2	IT infrasture of university is ready	67.46	3.72	1.02	71.18	3.72	0.89	0.00	0.09	0.17	0.17	0.00	1
CR3	Right time to promote e-learning	82.25	4.05	0.69	86.30	4.06	0.75	0.01	0.07	0.13	0.15	0.14	0.8852

5.7. Confidence in Readiness

According to finding in CR1 from Table 7, confidence in readiness of two student groups was significant difference under 0.05 and it indicated that their personal readiness was different. But, due to results of CR2, the readiness of Myanmar’s university was not different to Indonesia’s university. Moreover, in CR3, both student groups gave the same responses and they were welcome to adopt e-learning education at their universities.

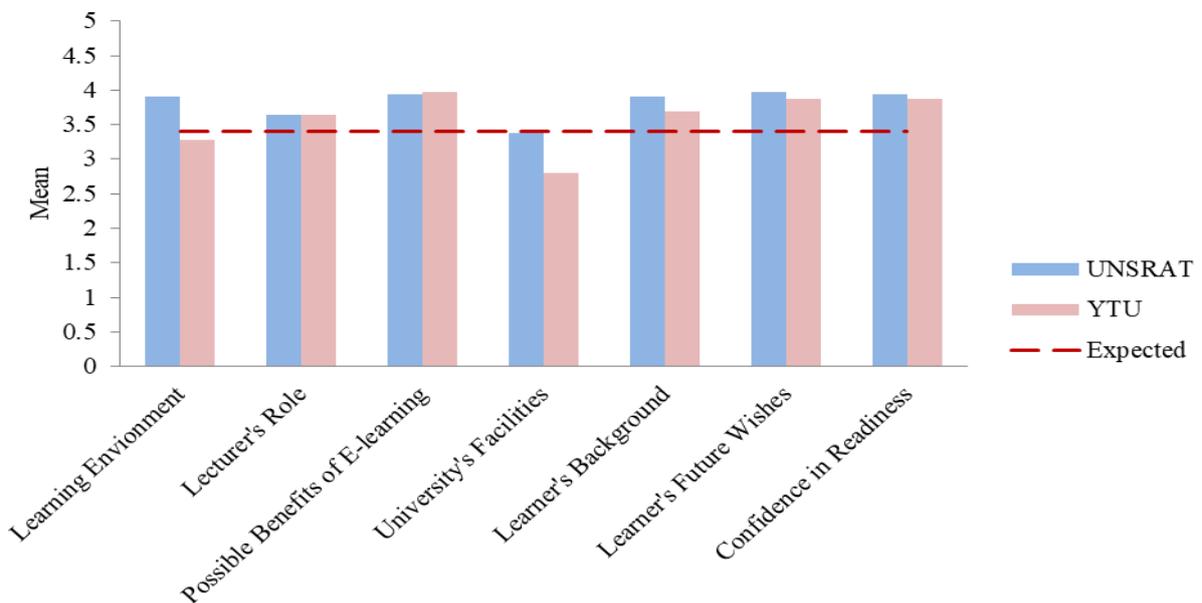


Figure 2: E-learning Readiness Level of UNSRAT(Indonesia) and YTU(Myanmar)

5.8. Readiness Level on Seven Dimensions

Based on means of seven dimensions, readiness level of UNSRAT and YTU was measured. As the expected level of readiness, the mean score of 3.41 was used to measure two universities’ readiness levels. The expected

readiness helped to determine higher and lower levels of readiness. As shown in Figure 2, the UNSRAT students were ready in e-learning from the points of their learning environment, their lecturer's role, and their possible benefits of e-learning, their background, their future wishes and their confidence in readiness although their facilities provided by UNSRAT was slightly lower than the expected level. If compared to UNSRAT, obstacles of YTU students were seen in not only their university's facilities but also their learning environment. These findings encouraged the members of YTU to find out possible solutions for those challenges and design better educational strategies in the near future.

6. Conclusion

This paper investigated a comparative study of UNSRAT students from Indonesia and YTU students from Myanmar. And a model of e-learning readiness was also designed to measure the students' readiness. The findings revealed that the YTU students' readiness in 2017 were over the expected level in six of seven dimensions. Although the UNSRAT students were already familiar with e-learning in 2014, YTU students without e-learning experience showed their positive readiness like UNSRAT. In addition, the obtained results indicated what were opportunities and challenges in two universities for e-learning education. Due to mean scores generated by seven dimensions, the key driver in UNSRAT was the learners' future wishes and its barrier was the university's facilities. Like UNSRAT, YTU also were facing the key challenge in the facilities. As a major opportunity in YTU, the highest response was found in the dimension of e-learning benefits. In conclusion, the both student groups were ready for e-learning but their universities' facilities were still not adequate enough to implement and support e-learning effectively.

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References

- [1] A. Al-Azawei, P. Parslow and Karsten Lundqvist, "Barriers and Opportunities of E-Learning Implementation in Iraq: A Case of Public Universities," *International Review of Research in Open and Distributed Learning*, vol.17, no.5, September 2016.
- [2] B. E. Zamani and A. Esfijani, "Major Barriers for Participating in Online Teaching in Developing Countries from Iranian Faculty Members' Perspectives," *Australasian Journal of Educational Technology*, vol.32, no.3, pp. 38–49, 2016.
- [3] K. Kaur and Z. W. Abas, "An Assessment of E-learning Readiness at Open University Malaysia," *International Conference on Computers in Education*, 2004.
- [4] A.A. Mosa, M. N. Mahrin, and R. Ibrahim, "Technological Aspects of Technological Aspects of E-Learning Readiness in Higher Education: A Review of the Literature," *Computer and Information Science*, vol. 9, no. 1, 2016.
- [5] List of ASEAN countries by GDP, 2017. [Online]

- https://en.wikipedia.org/wiki/List_of_ASEAN_countries_by_GDP [Accessed Jan.12, 2018].
- [6] International Human Development Indicators, 2017. [Online] <http://hdr.undp.org/en/countries> [Accessed Jan.12, 2018].
- [7] N. S. A.M. Kusumo, F.B. Kurniawan and N.I. Putri, “eLearning Obstacle Faced by Indonesian Students,” The Eighth International Conference on eLearning for Knowledge-Based Society, February 2012.
- [8] Khaing, S.S., Win, A., Aung, T.N., “SWOT Analysis of E-Learning Course Operation in Higher Education (Case Study: University of Technology, Yatanarpon Cyber City)”, Genetic and Evolutionary Computing, Advances in Intelligent Systems and Computing 388, Springer International Publishing Switzerland , 2016 .
- [9] Myanmar Education Quality Improvement Program(MY-EQIP), February 2017. <http://dfat.gov.au/about-us/business-opportunities/tenders/Documents/revised-draft-design-myanmar-education-quality-improvement-program.pdf>
- [10] P. P. T. Win, “An Overview of Higher Education Reform in Myanmar,” International Conference on Burma/Myanmar Studies ,Burma/Myanmar in Transition: Connectivity, Changes and Challenges, University Academic Service Centre (UNISERV), Chiang Mai University, Thailand, 24-25 July 2015.
- [11] List of countries by number of Internet users, 2016.[Online] https://en.wikipedia.org/wiki/List_of_countries_by_number_of_Internet_users [Accessed Jan.12, 2018].
- [12] Sam Ratulangi University(UNSRAT),2018. [Online] <https://www.unsrat.ac.id/> [Accessed Jan.12, 2018].
- [13] S. Arifin , A.S. Aisjah , N. Gamayanti, T. Dhanardono ,Yaumar and Y.Bilfaqih , “The Design of E-Learning (share.its.ac.id) Course “Sistem Pengendalian Otomatis” to Support Effective Learning Outcomes,”The 1st International Seminar on Science and Technology, pp.D31089-D31090, August 2015.
- [14] S. Paturusi, Y. Chisaki and T. Usagawa , “ Assessing Lectures and Student’s Readiness for E-learning: A preliminary study at National University in North Sulawesi Indonesia,” GSTF Journal on Education(Jed), vol. 2, no.2, 2015.
- [15] Academic Data of Universitas SAM Ratulangi Manado, 2015. <https://www.global.hokudai.ac.jp/wp-content/uploads/2015/11/1-B-4.-Sam-Ratulangi-University.pdf>
- [16] K.M.Tint, “The Development of Engineering Education in Myanar”, 2016.
- [17] Yangon Technoolgoy Unviersity,2018. [Online] <http://ytu.edu.mm/departments> [Accessed Jan.12, 2018].
- [18] Asean Cyber University Project, “Article of Busan Digital University supports Myanmar’s e-Learning”, 2017.
- [19] University of Technology (Yatanapone Cyber City), UT-ACU Joint Workshop, 2016. [Online] <http://utycc.moe-st.gov.mm/?p=812> [Accessed Jan.12, 2018].
- [20] Borotis, S. A. & Poulymenakou, A., “E-Learning Readiness Components: Key Issues to Consider Before Adopting e-Learning Interventions,” Proceedings of World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education,pp. 1622-1629, 2004.
- [21] Z. W. Abas, K. Kaur, & H.Harun, “E-learning readiness in Malaysia: A national report submitted to the Ministry of Energy, Water and Communications,” <http://asiapacific-odl2.oum.edu.my/C33/F70.pdf>

- [22] Shamaki and A., “Timothy, Influence of Learning Environment on Students’ Academic Achievement in Mathematics: A Case Study of Some Selected Secondary Schools in Yobe State – Nigeria,” *Journal of Education and Practice*, vol.6, no.34, 2015.
- [23] Kärnä, S., Julin, P. and Nenonen, S, “User Satisfaction on a University Campus by Students and Staff,” *Intelligent Buildings International*, vol. 5 , no. 1, pp. 69-82, 2013.
- [24] Price, I., Matzdorf, F., Smith, L. and Agahi, H, “The impact of facilities on student choice of university”, *Facilities*, vol. 21, no. 10, p. 212, 2003..
- [25] N. Srichanyachon, “Key Components of E-Learning Readiness,” 2010.
http://www.bu.ac.th/knowledgecenter/epaper/jan_june2010/pdf/Page_56.pdf
- [26] M. Haverila, “ Prior E-learning Experience and Perceived Learning Outcomes in an Undergraduate E-learning Course,” *MERLOT Journal of Online Learning and Teaching*, vol. 7, no. 2, June 2011.
- [27] C.H. Aydin and D.Tasci, “Measuring Readiness for e-Learning: Reflections from an Emerging Country,” *Educational Technology & Society*, vol. 8, no. 4, 244-257, 2005.