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Research paper



Comparative Analysis of Engineering and Art Learner's Readiness towards the use of E-Portfolio

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Abstract

This paper presents the comparative analysis learners' readiness among Engineering and Art students in higher learning institution. The study was focused on examining 120 students from Engineering and Art cluster to practice e-Portfolio for their courses. The pilot study was tested the reliability coefficient with Cronbach's alpha (α) of 0.825. The survey of learner readiness was divided into five constructs to assess the readiness towards using e-portfolio for future assessment purposes. The finding was concluded that the students are indeed ready to use e-Portfolio as an appropriate platform for integrative learning. The use of e-Portfolio will broaden the possibility to promote outcome-based education and constructive alignment which encompassed practical skills such as critical thinking, problem solving, information management and lifelong skills. The preliminary study proved that e-Portfolio is beneficial to students, faculty and stakeholders.

Keywords: *e-Portfolio; learner readiness; higher institution learning; outcome-based education; assessment*

1. Introduction

E-Portfolio is a new role of educational tool implemented in higher learning institution in which the students determine the degree of an e-Portfolio as an assessment to support and track their learning needs [1]-[7]. This learning method has emerged as an instruction and assessment strategy that made a significant impact on education [8]. The use of e-Portfolios is traditionally associated in higher learning institution as a platform for teaching, learning, and assessment [9]-[10].

The emerging technologies in education indeed brought major changes in education. The increase in big data analytics, internet of things, cloud services and the role of IT and computing in providing valuable data plus effective application made learning process and lessons delivery more independent and enjoyable.

In higher learning institutions context, e-Portfolio is one of the possible solutions to solve existing problem related to lessons delivery and assessment [11] – [14] which is in coherent with the educational policies and agendas towards evidence-based approach (PPPM, 2013; MQA, 2013). Although, e-Portfolio had been adapted in many field of studies but there are still some ongoing research being done to improve the existing e-Portfolios to offset with an ideal 21st century where individuals are expected to gain a variety of problem-solving skills and meet the needs of society within this program [15]. In line with [16]-[18] statement, the proponents of the e- Portfolio affirmed that e-Portfolio is a better medium in assessing and rectifying students' cognitive [19] at higher order thinking skills (HOTs) [20], skills and values.

Thus, appropriate model, approach and strategies are needed, followed by policies to encourage the e-Portfolio technologies in delivery and assessment . Findings indicated that more than half of higher learning institution in Malaysia have their own online system (blended mode) which showed that it is practiced widely in the country [22]. Therefore, having e-Portfolio should not be an issue to most learners with internet access and appropriate tools in higher education institution in the country.

2. Literature Review

The growing focus on measuring learning shows future interest in assessment of assessing students' knowledge, skills, and values. There is a reason why e-Portfolio becomes significant to measure and unfold students' ability, talent and visibility.

2.1. E-Portfolio Definition

As an evidenced-based approach, e-Portfolio is a piece of work or collection to showcase an individual's best achievement [23]. Portfolios are typically used with the intention of encouraging critical self-reflective lifelong learning and gathering evidence [23]-[25] of individual's expertise. A portfolio should prioritize learning and reflective learning to encourage learners to reshape ideas and receive feedback. In the future, e-Portfolio can be considered as an innovative delivery and assessment system that facilitators could facilitate learner's higher order thinking skills through reflection [13]. In brief, e-Portfolio is a collection of accurate and compelling [26] documentation of a learner's progress [27]-[28] in formal, informal and non-formal learning [29] anywhere and at any time [30].

2.2. E-Portfolio Learning Process

The key dissimilarity between traditional transcripts and e-portfolio is the ease to publish contents and proof in electronic format. E-portfolio is a useful tool for allowing a students to have opportunities to reflect upon their learning progress and as a vehicle

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for pre-service and in-service for instructors [31]-[32]. In general, the practicality of e-Portfolio helps to assess students' competence which makes this new method an efficient formative or summative tool. The learners have to display a certain skillset of experiences by connecting skills and knowledge gained in academic.

The acceptance of e-Portfolios is still a very challenging issue in higher education level which ought to be highlighted. This would also include addressing concerns with regard to strategizing learning strategies, assessment and institutional policies that would fulfil the requirements not only at the educational level but also to be utilized for employment purposes. To enhance the acceptance of e-Portfolio among learners, administrators and educators, there are elemental issues that need to be appropriately addressed such as the wide range of student needs and preferences, intentions, and purposes for using an e-Portfolio. All the essential considerations should be able to be used in the process of developing the e-Portfolio.

Researchers such [4], [21] and [33] have found two factors that showed the importance of e-Portfolio elements that can be a helpful tool in teaching and learning. These factors can enhance learning through constructive alignment with appropriate strategies of teaching, learning, and assessment. At this juncture, the learner readiness need to be examine to know technology readiness, behaviour readiness and values of e-Portfolio.

3. Methodology

The main objective of this study is to examine the Art and Engineering learners' readiness approach to e-Portfolio. The study involved students from Bachelor of Art & Design Education and Bachelor of Mechanical Engineering have been chosen for the pilot study with 120 students as respondents. The questionnaires revised from the E-Learning Readiness and The Online Readiness Self-Assessment Instrument. Each items checked with answer choices using Likert Scale ranging from (1) indicated that the statement is strongly disagreed upon, (2) indicated that the statement is disagreed upon, (3) indicated that statement labelled as not sure (neutral), (4) indicated that statement is acknowledged and (5) showing that the statement strongly acknowledged the readiness of e-Portfolio.

4. Data Analysis and Findings

As reported in Table 1, the demographic profile for Art respondents, 58.3% (n=35) were male and 41.7% (n=25) of the respondents were female. In the context of age grouping, 41.7% 22-23 years old (n=25), 20-21 years old, 26.7% (n=16), 24-25 years old, 25% (n=15), 1.7% 18-19 years old (n=1) and 5% (n=3) 25 years old and above.

As for the Engineering respondents, 53.3% (n=32) were female and 46.6% (n=28) were male. As for the age grouping for these respondents, 40% (n=24) 22-23 years old, 30% (n=18) 20-21 years old, 18.3% (n=11) 24-25 years old, 8.3 % (n=5) 18-19 years old and 3.3% (n=2) 25 years old and above.

The tendency of the Art and Engineering students using the Internet is as stated, 71.5% respondents were using the Internet regularly, followed by 23.3% routinely and 18.9% of the respondents used the Internet modestly. Based on these findings, the percentages showed equal internet accessibility within and out of the university compound with a difference of 2.2%.

Table 1: Frequency of Demographic Profile

Demographic	Art		Engineering	
	Fre	%	Fre	%
Male	35	58.3	28	46.6
Female	25	41.7	32	53.3
Age				
18-19 years	1	1.7	5	8.3
20-21 years	16	26.7	18	30
22-23 years	25	41.7	24	40
24-25 years	15	25	11	18.3
25 years above	3	5	2	3.3

Prior to this survey of the respective respondents, the researchers had conducted a pilot study with 30 respondents to attain the validity and the reliability of the instruments necessary to this survey. The pilot study was performed to identify the weakness and deficiencies of the constructs or items. The pilot study showed the result with Cronbach Alpha score of 0.825.

Table 2, 3, 4, and 5 shows the mean of the score on the findings of e-Portfolio among the respondents of the Art and Engineering programme.

Table 2: Technology Accessibility

No.	Items	Engineering	Art
1	Internet connection	4.17	4.16
2	New user of computer	3.82	3.88
3	Adequate software	4.25	4.33

From Table 2, the differences in mean score are statistically significant and positive. Both groups demonstrate relatively high score for item no.1 and 3. According to the result, access to the computer are at average mean, which needs to be highlighted as it may affect the learners' readiness towards the use of the e-Portfolio. For implementation purposes, the university need to have a mature technology access with hardware, software, network and human skills to support the use of the technology

Table 3: Online Skills and Relationships

No.	Items	Engineering	Art
1.	Basic computer skills	4.73	4.25
2.	Information skills	4.47	4.25
3.	Mailing skills	4.57	4.48
4.	Usage frequency	3.98	4.14
5.	Typing skills	3.70	3.83
6.	Online tools skills.	3.95	3.94
7.	Synchronous response	3.47	3.70
8.	Question skills	3.95	3.94
9	Commenting skills	3.70	3.83

Table 3 shows the distribution mean of answer for each item of Online Skills and Relationships among respondents from both groups. The results showed the similarity of mean scores are statistically significant and positive for items no. 1, 2, and 3. However, readings are slightly moderate on items no. 4, 5, 6, 7, 8 and 9 which needed to be focused on to ensure the respondents will have better online skills and relationships.

Table 4: Student Motivation

No.	Items	Engineering	Art
1	Self-driven	3.22	3.54
2	Online distraction	4..30	3.53
3	At home distraction	3.20	3.40

Table 4 shows the findings on student motivation towards e-Portfolio among the respondents based on their programme: Engineering and Art. Based on Table 4, the similarity of mean score are statistically moderate. Both groups demonstrate relatively moderate scores for item no.1, 2 and 3. Motivation readiness refers to the cultural elements that affect learner's role and function towards the successful emerging technologies. For this element, self-motivation of the learner plays an important role to ensure learner readiness towards new emerging technologies in their learning process. Motivation is not only assess on intrinsic and extrinsic, but fun through learning or known as hedonic motivation is a new dimension need to be discover with millennial generation.

Table 5: Online Discussion

No.	Items	Engineering	Art
1	Capable to carry on a conversation with others using the Internet	3.50	4.14
2	Capable to follow along	3.50	3.82

	with an online conversation while typing		
3	Need time to reflect	3.85	3.91

Table 5 shows the mean findings on internet discussion towards e-Portfolio among the respondents based on their programme: Engineering and Art. Results in Table 5 shows the similarity of mean scores for Engineering respondents are statically moderate while item no.1 for Art respondents shows slightly high mean score at 4.14. Both group demonstrate relatively moderate score on items no.2 and 3.

Table 6: Importance to Success

No.	Items	Engineering	Art
1	Quick technical support	4.17	4.04
2	Quick administrative	4.17	4.04
3	Constant participation	3.93	3.88
4	Preceding experiences with online technologies	4.17	4.04
5	Course material	4.07	4.03

Table 6 shows the result for importance to success among respondents of both groups. Results in Table 6 shows the mean scores are statistically significant and positive. Both groups demonstrate relatively high score for items no.1, 2, 4 and 5. Based on the result, the frequency of participation is at an average mean, which means that it may affect the success of online learning. High mean score for item no.1 shows that quick technical support is very important when using online learning. Due to the self-pace learning concept, online learning should have the function and ability to accommodate learners with strong technical support.

Table 7: Compare Mean E-Readiness between Art Humanities and Engineering

Constructs	Art Humanities	Engineering
	Mean	Mean
Technology Access	3.89	4.07
Online Skills	4.01	4.03
Motivation	3.56	3.30
Online Discussion	3.98	3.72
Success	3.75	4.03

Table 7 shows the comparative learners e-readiness analysis between the Art and Engineering respondents. The high mean scores on technology access (Art, m=3.89 and Engineering m=4.07), online skills (Art, m=4.01 and Engineering m=4.03), online discussions (art, m=3.98 and engineering m=3.72) and success (art, m=3.75 and engineering m=4.03) shows that the majority of the respondents from both groups are indeed Internet and IT literate and would not have problems for any online learning requirement. However, the moderate mean score on motivation (Art, m=3.56 and Engineering m=3.30) from both groups shows that it is indeed the lack of self motivation is the hindrance in most online learning process. Therefore, it is crucial for the facilitators to be creative in motivating students' to be more self-driven towards their journey of learning.

This data shown that the development of e-Portfolio should thoroughly find ways to increase learners' motivation and make them belief the success of using portfolio for learning documentation and showcase. Somehow, to ensure learners actively participate online discussion by adapting reflective learning model. Reflection learning model is one of the strategy to improve communication skills and critical thinking. Set condition with specific situation, tasks, activity, reflect and result that allows to diagnose the efficiency of teaching and learning.

5. Conclusion

Based on these findings, there are five important elements when discussing about the learners' readines towards the use of E-Portfolio which are; (1) technology accessibility, (2) online skills, (3) student motivation, (4) online discussion, and (5) importance to success. These elements gave the researchers an indicator to have a strong ground work in promoting e-Portfolio for students. The internalizing process needs to start from explaining why and how the e-Portfolio will give impact on their learning experience and employability in the future. The execution of e-Portfolio needs proper planning, framework and implementation to ensure the success of this initiative. With the fourth industrial revolution and education 4.0, e-Portfolio have the potential on taking place in teaching and learning.

5.1 Technology Readiness and Adoption

Technology readiness has been broadly studied emphasizing innovations, management of the latest technologies, their diffusion and adoption. A research state that, technology readiness as a successful model to explore user's tendency towards new ideas and technological innovations. In the use of e-Portfolios, it was explaining and predicting user adoption of new technology has an inquisitor of attention in both academia and training. This study validates technology readiness constructs in the context of sector higher learning institution especially in the development of an e-Portfolio. As a result, the terminology of technology-readiness states to consumers' proclivity to embrace and use new technologies for accomplishing and completing goals in whole life.

5.2 Higher Learning Institution Microcultures

Reforming higher learning institution towards e-Portfolio initiative may require microcultures changes. Identifying higher learning institution microcultures through assessing readiness and adoption of emerging technologies. The resistant factor form individual or group can create the challenge to institution to embark wide adoption. The institution need to be objective and explain why and how to benefit this reform. The university need to recognize and strategize the differentiation by filling the gap at all dimension such ages, group, perception, acceptance or any that many reflects the success of this initiative. The cultural differences attributes requires understanding of the norm to change the new behaviours and accept the technology as a part of their responsibility.

5.3 Student Perception on E-Portfolio

The emerging technologies is not the only factor to ensure the success of learning. The acceptance of e-Portfolio technologies is depends on technology readiness, behaviour readiness and values of the users. Based on the results of this study, most of the respondents of both groups agreed that e-Portfolio contributes positive and significant impact on their learning process and experience. The use of e-Portfolio is towards promoting 21st century skills such as communication, critical thinking, creativity and collaboration in new dimension of delivery and assessment. The e-Portfolio is also a scaffolding process between facilitator and learners. This allow the facilitator to focus on the intervention and monitor learner's performance from time to time. Due to that, e-Portfolio can be applied as formative and summative assessment in measuring effectiveness, competency and impact of learning.

As the use of technology is growing extensively, it is essential to ensure that learners are well-equipped with the hardware and software knowledge and skill as it will help them gain employment with the engagement of the learning tools. Thus, a good technology accessibility allows the learners to maximize the utilization of e-learning for teaching and learning. Therefore, faculties or institutions should take an initiative to increase the quality of services and facilities to ensure the success of its learners.

The findings of this study showed that the respondents observe moderate level of motivation which is related to their learning effort. Learning effort is referred to a learner's effort to be active and self-directed to increase his learning performance and achievement. Numerous studies have shown that by introducing self-directed

activities in learning environment helps to motivate learners to be more active. By being self-directed, learners are immersed in experiences in which they are engaged in by making meaning, inquiry, interaction and reflection. In this context, the facilitator need to design an appropriate online context to enable them to be self driven in their learning process.

In conclusion, this study is to determine the condition of the learners' readiness of online learning before e-Portfolio technology embark and takes place as one of the initiative for delivery and assessment. The readiness indicates the strength, weaknesses and opportunity to ensure the success of this initiative.

5.4 Learning Design and e-Portfolio Assessment

In 21st century education demands differentiation and diversity of learning preferences and needs. The innovation of teaching, learning and assessment is a prerequisite to ensure quality in producing future graduate and also the improve the program academic quality. The lecturers need to be agile, able to learn, unlearn and relearn by upskilling or retooling. E-Portfolio is about to strengthen professionalism of lecturer and learners. In addition, they carried the same aim and objective in which to be visible and marketable locally and globally. Active learning is not anymore apex of learning but lecturer or educator urge to shift towards the connectivity of meaningful learning via exploratory learning act behavior.

6. Limitation and Future Research

In this study, the results of the samples do not accommodate the total population of a Social Science and Humanities and Engineering faculty. The reliability of the instrument in this study should be justified in the early stage of this study to determine a more accurate result. Therefore, the instruments should be tested to ensure its reliability in the actual fieldwork for better study result. This study also has limitation in the sampling technique used. Hence, in future research, it is important to define better sampling techniques as it will facilitate the research flow and could represent the required participants.

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