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E-PORTFOLIO DEVELOPMENT AND IMPLEMENTATION IN MALAYSIAN TECHNICAL AND VOCATIONAL EDUCATION TRAINING (TVET): A MIXED METHODS ANALYSIS OF STAKEHOLDERS' AND STUDENTS' PERCEPTIONS

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In line with the global increase in the use of E-portfolio technologies in learning organizations, their potential use in Malaysia is promising, especially in the growing areas of Technical and Vocational Education Training (TVET). In order to understand and evaluate the potential of E-portfolios in these education areas, the initial view of the parties related to the Skills Training Program, a sub-program in TVET should be taken into consideration. Since such an electronic learning system has never previously been deployed in any public or private training institutions in Malaysia, there is a need to ensure that it has the support of the parties concerned. Thus, the key questions for this study were to investigate whether the E-portfolio is: (1) suitable for implementation in the Malaysia Skills Training Education Program, and (2) easy, efficient and effective for students to use. This study used both qualitative and quantitative methods where data collection included E-mail based interviews with several officers in Malaysia and a survey of perceptions of E-portfolio Skills Training Students from the Kuantan District of Pahang, Malaysia. The results showed that most participants agreed that the E-portfolio is well suited to be implemented as an evaluation method or value-added to improve the IT skills of the students depending on their level of training course. Although some trainees/students warned that this system needs lots of things to be considered such as facilities, technical and emotional support as well as a sensible process, most agreed that this system should be introduced in their training institutions. Similarly, the interviewees also highlighted constraints that should be considered before execution to ensure that this system will be effectively installed and completely functional to benefit trainees, instructors as well as for the Training Institutions themselves.

Keywords: Electronic portfolio, Skills training, Competency based training, Vocational education.

Introduction

The use of E-learning is becoming a distinguished and significant issue in current learning and teaching methodology. E-learning comprises a wide set of applications and processes which use all available electronic media to deliver education and training. The term covers computer-based learning, web-based learning, and the use of mobile technologies; it includes virtual classrooms and digital collaboration (John, Kay, & Lynch, 2003). In Malaysia, a variety of E-learning systems have been introduced such as

the learning management system by the Open University Malaysia to encourage student participation in learning. However, issues like students' awareness, lack of computer and bandwidth facilities, content quality and language barriers have constricted the usage of E-learning (A. Ali, 2009). According to Ali , another recognized gap in E-learning technology is complexity. E-learning was perceived as complex and led to early misconceptions by learners such as difficulty in navigating, instructions were hard to comprehend and the process to accomplish tasks was complicated.

On the other hand, the E-portfolio is a subset of E-learning technology that simplifies some functions in E-learning (Hallam, 2008; Lorenzo & Ittelson, 2005). E-portfolios focus on students' participation in compiling and collecting learning evidence or artefacts as indicators of their achievement (Al-rawi, 2009; C. Chang, 2008; Hallam, 2008; Lorenzo & Ittelson, 2005). This technology is one of the blended learning methodologies that combine traditional learning with electronic engagement. A web research for E-portfolio applications in all Universities and Public Higher Education shows that the University of Technology Malaysia was the one and only Higher Education Institution in Malaysia that employs this system while other institutions are still in the development and testing phase. In the Malaysian Skills Certification Program (MSC), which is one of the certification programs under the Malaysian Vocational and Education Training (VET), no institution or industry has yet introduced this application for their trainees. It is because in VET, the learning approach was different from the common higher education system and the additional features like work-based training, competency-based-training, employability skills and other technical aspects that need to be embedded into the system make it complex to develop due to high development costs and maintenance expenses (Abd Aziz & Haron, 2012; Dollah et al., 2012; Zulkefli, Yusoh, & Ibrahim, 2012). Eventually, most VET institutions chose to run a traditional system instead of adapting the technology for training.

Therefore, this study's aim was to investigate the technology to be introduced and deployed in the Malaysian Skills Training Program. Both interviews and survey were employed to obtain views on the implementation of E-portfolios in the program. The preliminary findings will inform the requirements and matters that need to be considered for the adoption of the E-portfolio during training courses. This paper presents the findings of (1) interviews conducted through official E-mail to five Ministry government officers, two principals of training institutions and three instructors working on the Malaysia Skills Training Certification Program, and (2)results obtained from survey questionnaires of Skills Training students' in the Pahang State of Malaysia.

Literature Review

E-portfolio in Higher education

The electronic portfolio or e-portfolio is currently one aspect of online learning being deployed in most developed countries primarily to support teaching and learning in higher and professional education. While it is impossible to precisely determine how many institutions have adopted E-portfolio systems, their adoption continues to grow (Lorenzo & Ittelson, 2005). Countries in Europe established the E-portfolio project (http://www.europortfolio.org/) for promoting research and development of E-portfolios for higher education, further education and lifelong learning. This would indicate that the utilization of E-portfolio applications has recently improved significantly, becoming acceptable in schools and higher institutions in Europe and the United States. In the United Kingdom, the Joint Information System Committee (JISC), one of the leading organizations in the use of digital technologies in UK education and research was actively supporting research about the implementation and engagement with this application by collaborating with the local higher education sector. The latest report about e-portfolio large-scale implementations, resulting from the e-portfolio implementation (ePI) study was published in 2012 through the JISC website. The study that was led by Dr. Gordon Joyes and Angela Smallwood from University of Nottingham began in 2010 and ended by 2011. The findings from the reports show that e-

portfolios might support students' reflection by having personal learning experience with the system. It was also cost-effective in terms of resource provision by the institution. The report also presents guidelines to every stakeholder who plans to implement this system (Joyes & Smallwood, 2012).

The benefits of e-portfolio applications in education were also widely justified by previous research such as that by Barrett (2005) who noticed that the growth and development of learners could be accessed through a series of E-portfolio processes, such as reflection, goal setting, and self-assessment. In the online learning model, involving reading, reflection, display and doing (R2D2), which was proposed by Bonk & Zhang (2006), reflection is derived from E-portfolios to conduct self-assessment. This is supported by a report from the E-portfolio Consortium, a European e-portfolio research group where they informed that a primary function of an E-portfolio is to act as an online tool for evaluating student learning (Sloan Consortium ,2003). Mcmahon & Luca (2006) regarded an E-portfolio as a self-monitoring and evaluation tool for online learning. Moreover, research on E-portfolios as a medium to gathering feedback shows that those students at Abilene Christian University, Australia, placed their written reflection in E-portfolios while creating their projects(Dennis, Hardy, & White, 2006). Chang (2001) indicated that web portfolios generate numerous effects, such as controlling the learning process, self-examining the advantages/disadvantages, enhancing student development, and are beneficial to learning. A number of studies have demonstrated that portfolio assessment could improve student learning outcomes (Barrett, 2005; Dennis et al., 2006).

E-portfolios in Vocational Education and Training

In vocational and education training, many countries have implemented this application as part of their E-learning education support program (Altahawi, Sisk, Poloskey, Hicks, & Dannefer, 2012; Cameron, 2012; Martín, Fernández, & Sanz, 2012; Sluijsmans, Prins, & Martens, 2006). Portfolios are an alternative form of learning and assessment that are particularly attractive to the vocational educator because they include the assessment of active learning and performance rather than the mere recall of memorized facts (Turhan & Demirli, 2010). Portfolios serve the interests of business and industry as well by forging a connection between activities in the classroom and real life. However, the successful achievement of these anticipated outcomes depends upon the purposes, practices and structures that guide implementation of this new form of learning and assessment in vocational education. Turhan & Demirli (2010) reported from their study of vocational education teachers' and students' perception of the use of E-portfolios in the United Kingdom, Denmark, Romania and Turkey and showed that both teachers and students found that the E-portfolio process was necessary in vocational education as part of the learning process to collect evidence, monitor work progress, skills and knowledge assessment as well as measuring student's reflection on lessons.

Furthermore, based on the results of a Leonardo da Vinci project for further education in the UK (*MOSEP - More self-esteem with my ePortfolio*) E-portfolios are known as a technology supported learning method for the documentation of competency development (Hallam, 2008). They outlined a new training concept for teachers and tutors using open source E-portfolio software tools. They quoted opinion from Hilzensauer (2007), that the work with E-portfolios could be a sustainable measure to support self-directed learning. This is supported by Kicken et. al (2009) who reported that vocational students in the Netherlands who receive advice to develop their self-directed learning skills using E-portfolios are better than students who only receive feedback throughout the course.

Why E-portfolio?

To become a high income and developed economy by 2020, Malaysia has initiated diverse strategies to boost the country towards its objective. One of the keystones of this aspiration is the provision and preparation of highly skilled human capital, the lack of which has stalled the nation's effort to set off from the middle income trap, into a high income economy. In this context, Technical and Vocational Education and Training (TVET) plays a pivotal role in providing the skilled workforce required for the country's economic transformation (Leong, 2011).

As the world has been utilizing Information Technology (IT) for most of the business in all areas, TVET in Malaysia should take similar steps in order to produce highly skilled workers that are IT-savvy. Malaysia has developed a number of internet establishments, so that it is an opportunity to provide the training institutions with Internet facilities. TVET should revitalize the training pedagogy to include the online and electronic learning in the curricula. The Malaysia Ministry of Higher Education in its report on The National Higher Education Strategic Plan Beyond 2020 quoted:

"One of the five strategic thrusts outlined in the 10MP is to develop a world-class human capital by focusing on the 12 National Major Economic Areas (NKEAs), especially in the field of information and communication technology (ICT), and education services." (MOHE, 2013, p96)

The Skills Training Program which is a sub-program under TVET currently deploys a file based portfolio encompassing trainees' paper based competencies and evidence. This evidence could include reports, project papers, assignments or assessment sheets. Therefore, to transform the current paper based folio to the electronic one is sensible in order to empower those trainees with IT skills.

The Director of the Department of Skills Development, Ministry of Human Resource, Dr Pang Chau Leong, stressed in his research that skills training in Malaysia experienced issues such as poor perception and recognition of TVET due to societal stigma created by the impression that this program is focusing on school drops-outs, a second class education with fewer opportunities for success in their careers. Other issues like poor monitoring and evaluation of trainees also arose when certain training institutes had not improved their curriculum and facilities to get on par with the standard that has been set (Leong, 2011)

By looking at these issues, e-portfolios might play a role in being able to gain interest from the public, especially from parents and prospective trainees/students, in terms of technology adopted and as a 'buy-in' component of the skills training program. Moreover, institutions that employ e-portfolios for their students will increase their image to the employer and career provider as a technology enhanced institution. Other than that, online E-portfolios could also supplement training curricula, especially for those who are not enrolled on the computer-based courses like plantation, electrical, beautician, fashion design and culinary.

Hence, this research will investigate the following questions:-

- What are the stakeholders (government officers, principals and instructors) and students' views about an E-learning or E-portfolios to be implemented in the Skills Training Program?
- What are the advantages and limitations of implementing E-learning in the Skills Training Program?
- What are the key factors that will ensure the success of the e-portfolio implementation?

Methodology

As this project requires both quantitative and qualitative approaches to collecting data and evidence, this study had a mixed method approach which has its primary philosophy as pragmatism (Crotty, 2003).

Pragmatism has many definitions depending on the situation and research that is associated with it. Pragmatism is accepted as the main ideology because it is concerned with the application that works to provide solutions to a certain problem. It arises out of events, circumstances and consequences rather than precursor conditions (Crotty, 2003). Besides, mixed methods research is an approach to knowledge (theory and practice) that attempts to consider multiple viewpoints, perspectives, positions, and standpoints (Johnson, Onwuegbuzie, & Turner, 2007). Creswell (2012) states that pragmatists believed in truth that is generated from consequences. Therefore, pragmatist researchers are free to choose the methods or techniques that meet their needs and purpose.

One important technique in pragmatist ideology is triangulation. Denzin (1978) defined triangulation as "*the combination of methodologies in the study of the same phenomenon*" (p. 291). Most empirical mixed methods studies in recent years have utilized two or more different types of data or data collection techniques (Small, 2011). Therefore, this project will employ data and methodological triangulation which, according to Denzin can be divided into four areas: data, theory, investigator and methodological. Data collected in this project will be from various forms like interviews and surveys, employing a sequential approach (Morse, 1991). According to Morse, sequential triangulation is utilized when the results of one approach are necessary for planning the next method which is relevant to this phenomenon, and which requires the results from interviews and survey to plan next research process.

The quantitative part focuses on exploring trainees' attitude and understanding about e-learning and the possibility of it being introduced at the training institution. Qualitative studies, on the other hand, take into account the lived experiences of the participant including feeling, emotion and physical engagement, hence enabling contextualisation of the analysis of the phenomena. The qualitative part also intends to convey meaning and significance in relation to the improvement of skills training pedagogy using electronic learning tools.

The survey questionnaire was distributed online using the Limesurvey application and database. The participants were invited via email and promoted to 'Pahang' state of Malaysia. 70 questionnaires were completed. Qualitative data was collected via E mail based interviews (due to distance limitation between UK and Malaysia) which were scheduled over a three month period. Ten (10) participants who included the government officers, the principal and the trainers of skills training institutions in Malaysia were interviewed.

Findings

Transcriptions of interviews were analyzed within a month after receiving the entire transcript. A priori codes based on the literature review themes and research questions for the study were developed. These are represented in these findings with a summary of the responses from participants including representative quotes.

Theme 1: Perceptions of E-learning and E-portfolios

A Virtual Learning Environment (VLE) is defined as a computer-based environment, also referred to as electronic learning (E-learning), which allows interaction and relationships with other participants (Freitas & Mayes, 2004). An Electronic Portfolio (e-portfolio) that is part of the VLE is proposed for implementation in the Malaysian Skills Certification program, the Ministry of Human Resources Malaysia. An e-portfolio is a collection of digital artifacts or work products, including the evidence of learning, demonstrations, resources, and accomplishments of individuals, groups, communities, organizations, or institutions.

a. *E-portfolio definition and function*

From the survey data, it was confirmed that only 34% of all students had used any kind of e-learning system, and another 66% had never been introduced to e-learning. But, despite students having no idea of what an e-portfolio is, they still could imagine the definition and purpose of e-learning and e-portfolios from existing knowledge. The result shows that although many of the students had never been exposed to e-learning or an e-portfolio application, they could imagine that this system was an internet based learning system that was developed by a specialized application or program. A high percentage perceived the e-portfolio as being a medium for online submission of assignments or specific tasks. This indicates that the students are more likely to associate the e-portfolio with a traditional file portfolio, the function of which is to collect evidence of skills competencies such as assignments to be evaluated. They anticipate that this system will be an online version of a paper portfolio.

Consequently, the majority of the interviewees who were officers, principals and trainers viewed the e-portfolio as a collection of student work which records their achievements over the learning and training duration. Some interviewees saw the e-portfolio as an assessment collection point, through which the students' evaluation will be completely verified. In addition, the majority of the instructors said that the e-portfolio could be described as a medium that might be used to monitor the progress of students throughout their assignment development. They also considered the e-portfolio to be useful to act as a means for virtual communication between students and instructors.

"I think this system can also be used to monitor student performance if they are to complete the task or not…"- Instructors

"..Communication between us and them is very important. Though we cannot meet face to face, we still can respond through the system...If the system able to do that…"- Instructors

Apart from the comprehensive functions of the e-portfolio, a number of them also believe that if the system is used in a committed and intensive way, it can be used to assess the ability of the students. Students can submit assignments through this system and then have them reviewed and certified by the instructor. However, each assignment must be completed with the proper documents so that marking or grading can be conducted in a fair and equitable way.

b. *Perception of designed E-portfolio*

The interviewees were requested to confirm whether the e-portfolio development should be carried out and implemented in the Skills Training Program. All participants showed full support for the e-portfolio to be developed and executed in this program. However, there are conditions that need to be taken into account such as: the system must be in accordance with the requirements of the program; it must be a user-friendly and attractive system; and the implementation will be based on the consent of the superiors and management in the respective Skills Training Institutes. The students also expressed their views on the necessity of e-portfolio implementation in Skills Training program. 50% of student respondents confirmed that they felt very strongly that the e-portfolio should be included as part of the training and learning process, while 36% of them voted it to be necessary. Likewise, a total of 90% of respondents agreed that this system should be introduced and implemented in their training institute.

All participants agreed that students of the Skills Training Program should be exposed to the IT technologies such as e-learning, e-portfolio and any electronic application that suits their learning environment (Abd Aziz & Haron, 2012; Dollah et al., 2012; Zulkefli et al., 2012). This is supported by Saud, Rahman, & Shiung(2007) who obtained the views of vocational undergraduates from several Malaysian higher learning institutions in relation to e-learning applications for vocational and skills trainees. The findings reported that majority of the undergraduates agreed that vocational and skills

trainees need to master a variety of computer skills in addition of their course specialization in order to pursue the higher learning pathway as well as to step into the world of work.

c. ***Important key factors in developing an E – portfolio***

Prior to any system development, it is necessary to emphasize the important features required by the target user to ensure the success and usability of the system (Ellis, Ginns, & Piggott, 2009; Randall & Neiman, 1994). Since the end user is the one who will apply the system, any comments and suggestions from them should be taken into account.

According to some interviewees, the main factors contributing to the acceptance of students to apply the system are the instruction language used. Since most of the students were poor in English communication, then it was recommended that the system be developed in at least two languages, the other beingMalay (Zulkefli et al.,2012). Furthermore, the system must be user friendly and has understandable functions since not many students were IT literate and proficient in the online system. The user manual should be complete with step by step explanations and clearly define each function in the system.

From the interviews the senior officers stressed that the system should contain training modules for each course. The modules need to be pre-loaded before implementation begins. This will make it easier for students to choose their modules to load their work and assignments. mentioned this in his literature review of e-portfolios whereas for electronic portfolio systems to be successful, a different set of criteria needs to be met. Apart from the factors mentioned above such as complete user manual, appropriate language and pre-loaded modules in the system, the interviewees raised some other issues that should also be included in the success criteria such as process planning, intensive training for users, support and enforcement from management and to provide students with frequent motivation with the aim of emphasizing the importance of this system in the learning process.

On the other hand, data from the survey questionnaire indicates that "Passion and determination of the user" and "Provision of facilities" earned the highest percentage, so are considered to be the foremost factors that influenced the success of e-portfolio in one institution. Meanwhile, the "Enforcement from management" factor was ranked last. (Table 1).

Table 1: Ranking of success factors in e-portfolio implementation.

Ranking	Factor
1	Passion and determination of the user
2	Provision of facilities (e.g. devices, computers, Internet)
3	The purpose of the system (e.g online assessment, social interaction, compilation)
4	Technical assistance from other related personnel
5	Support and encouragement from third parties (colleague, instructor, principal)
6	Enforcement from management

Theme 2: Benefits of E-portfolios

Previous research has suggested that e-portfolios could provide clear benefits which are considered important in the vocational teaching and learning process (Turhan & Demirli, 2010; Hallam, 2008).

Results from the interviews found that the benefits expected to be generated through the implementation of the portfolio can be divided into three parts: enhancing students' reflection, improving learning skills and saving resources.

a. *Enhance students' reflection*

E-portfolios allow students to upload their work either for personal satisfaction or to be reviewed by others. Furthermore, e-portfolios allow online multi-party communication. Most interviewees believed that encouraging communication between instructors and students or among students themselves, could increase the confidence level of the students towards their training objectives.

"I think they can personally ask if there is a problem that should be resolved with the instructor through this system. This may be more focused on students whom behave shy and inferior to ask during lecture session…." – Instructor

In addition, the instructors believed that indirect virtual communication could support students to actively respond. It allows fast feedback and they could reflect and improve their work according to instructor's annotations. This phenomena will create an active learning environment among students and would also able to bridge the communication gap outside of the classroom between students and instructors. Other than that, the students can interact socially with partners in producing group work or open space discussions. By using this online system, it is easy to share their work with peers, parents, instructors and prospective employers.

b. *Improve learning skills and knowledge*

E-portfolios are also expected to provide benefits in terms of enhancing students' computer skills as well as computer applications and internet use (Abd Aziz & Haron, 2012; Zulkefli et al., 2012) . Moreover, by using resources obtained from the internet and support from organizing functions in the E-portfolio itself, they can develop a more organized and structured report a. They can also use more extensive material including pictures, sound, animation, graphic design and video. This report can facilitate them to complete the assignments throughout the course work period.

"..When they are exposed to an online system that requires internet access, it's likely they will be exposed to internet facilities such as information search on 'Google' and other applications that are available in the internet…" – Instructor

".. The progress monitoring functions that are available in the system might possible to enhance their ability to produce reports that more structured and organized" – Instructor

Based on survey data, 46% of respondents agreed that e-portfolios could enhance their knowledge and skills in computer and information technology. This additional skill is imperative for them because as a skills training graduate, they need to be equipped not only with their field skills, but the basic skills needed to work in the industry later. Statistics show that 58% of them are certain that this system will contribute as a learning tool to assist them during training, while 36% were relatively convinced.

The survey also investigated the expectation of the students towards e-portfolios if this system were to be executed in their institution. Most of them agreed that this system will improve their IT skills and knowledge. In addition, they also hoped that this system will be an easy and comprehensible system for them (Table 2).

Table 2: Students' expectations regarding e-portfolio application.

No	Expectations of the e-portfolio application	% of respondent chose
1	It will improve my IT skills and knowledge	57%
2	It will be an easy and comprehensible system	46%
3	It will give me new skills and new experience during learning	43%
4	It will be a tool to enhance my understanding of the course enrolled	22%
5	Everybody will give cooperation, support and encouragement	18%
6	It should not be a compulsory, only voluntary participation	9%
7	It should be compulsory for all, so it will be deployed fairly and equitably among students	6%

c. ***Saving resources***

Cost is an important issue considered by each organization in relation to any activity or improvement. Abrami & Barrett (2005) viewed e-portfolios as a cost effective technology to be distributed among learners. This is agreed by Freitas & Mayes (2004) who mentioned that using technology is a more cost-efficient way of bringing the learning environment to the learners.

Views have been obtained and summarized into three main groups of resources such as time, training materials and energy. Most of the interviewees, especially instructors, thought that this system can help them save time to communicate with students and provide feedback on students' work beyond lecture or training time. They also believed that by using an online system they could possibly respond to lots more student inquiries as well as speed up the response time with a large numbers of students.

On the other hand, most principals and officers projected that e-portfolios could save the cost of materials involved in training like paper, files, stationery and printing/photocopying. Some of them mentioned that students complained about the cost of printing and binding work which is getting more expensive. They hope that this system can reduce the burden of these costs for students.

"This system might save the cost of materials such as paper and printing because these works can be viewed through online"- Principals

This corresponds with data from the survey questionnaire where 40% of the respondents agreed that by using the e-portfolio, it might save printing costs, time and energy for the student. Meanwhile, 29% of students agreed that this system might increase the consultation space between student and instructor via online communication. Besides saving time and materials, e-portfolios could also assist in helping users to save their energy during learning and training sessions. The instructors pointed out that that this kind of e-communication particularly helped students who stay off campus and find themselves unable to attend any extra group discussion meetings with peers beyond the classroom timetabled sessions. This group of students could use the discussion forum in the system and participate on-line.

Theme 3: Constraints and Issues with E-portfolios

Despite the benefits that may be offered by the e-portfolio, challenges and constraints to the development of this system should be taken into consideration so that successful implementation can be achieved. Previous studies have presented a number of issues involved with e-portfolio(Abrami & Barrett, 2005; Carliner, 2005a; Challis, 2005). The issue of the authenticity and originality of student work and how to

ensure that the evidence submitted is actually prepared by the students themselves was raised by Abrami & Barrett (2005). Furthermore, they pointed to the difficulties in determining the ownership of the work because sometimes students neglect to keep their work safe. More issues to be addressed concern administration of the system, data management, security and limitating student access to other people's work (Challis, 2005).

According to the interviews relating to issues and problems that may be encountered before and during the implementation of the e-portfolio system, all interviewees agreed that there are numerous challenges that need to be measured before implementing this system intensively. 45% of students also agreed that to implement and establish this system might need full cooperation from all parties and this is a great challenge which needs to be taken into account. These views were collected and categorized into four groups: attitudes and user acceptance issues; issues associated with top management; technical support issues and issues of implementation costs.

a. ***Attitudes and User acceptance Issues***

Both instructors from public and private institutions stated that any kind of system could be implemented but, in terms of adopting these technologies, it requires a longer time to familiarize trainees to internalize the system due to the attitude and skills or weaknesses in the trainees themselves. Based on the information gathered, they mentioned that the system will expect to confront with user issues like lack of computer skills, low self-esteem, low level of creativity and innovation and becoming too dependent to others. They quoted:

"… Major challenge for the implementation of a system if the user is unfamiliar with the computer, such as student in cookery courses, electrical, sewing and other courses that is not involved with computer technology…. It's quite hard for them especially who background was from urban area and not exposed to this kind of technology…." – Instructors

This is also likely to be experienced by the instructor who has poor IT knowledge and skills regarding the. Similarly, the student respondents also admit that passion and determination of the user is the most important challenge to be encountered (see Table 3).

b. ***System Design***

As asserted by the design of a system must meet the needs of users from different backgrounds, including those who possess low technical skills (Zulkefli et al.,2012). The features such as two languages, easily identifiable of user interfaces, clear icons and understandable utilization flow ought to be included in the system. However, since the system is developed using open source software and has limited functions, the system developers need to find alternative ways to meet the user requirements. The instructors were less worried about the issue of plagiarism because these students have to develop reports based on individual practical work. Any replication can be detected manually by the instructor based upon their close involvement with the student's work. Therefore, they felt that designs which incorporate features that can detect plagiarism are not really necessary for the time being. From the students' viewpoint, they seem to demand a system that is easy to explore and contains comprehensible functions. Although MAHARA is relatively easy compared to other full featured e-portfolio systems like pebblepad, this demand should be taken into account when considering that the majority of these students having academic difficulties.

c. ***Management Issues***

According to most interviewees', in order to implement this system in the training institution, the support of the management and administration is of the utmost importance. This is because if they feel that the

system is beneficial to the organization, then they will cooperate in enforcing the use of the system for students and instructors as well as grant approval to provide the hardware and software required. But if management refuses to provide support, users will view the system as unimportant and can decide not to use the system in practice. Therefore, this system must have the trust and approval from management and stakeholders in the organization. Gaining that trust is a challenge that must be faced with determination.

"..Support from management was very important especially in the provision of facilities and the need to implement this system effectively. In addition, enforcement should also be notified to the students and instructors so that they comply with the directive. If management act with nonchalant attitude, the student and the instructor will not see the significance of this system in their institutions…more or less, they will ignore it just like that…" - Instructors

d. *Technical Support*

Assistance from the support team is essential as it plays a role in increasing users' motivation and confidence while using the system (Ellis et al., 2009). Since this system was implemented and monitored at-a-distance, then technical assistance had to rely on online communication methods such as email and instant messaging (Skype, Yahoo messenger, Facebook, twitter and google chat). Interviewees thought that there ought to be a person appointed to operating the system and dealing with help enquiries which would have facilitated faster and more directed assistance with the problems encountered.

Alternatively, the developer must provide a comprehensive manual for the system with each function clearly explained. Additionally, online assistance should be available at all times due to the time difference between the two countries.

e. *Implementation Cost*

The majority agreed that cost is an important factor in determining the direction of any transformation in learning systems. To develop a system in a training institution, the costs include provision of hardware and software, training costs, the cost of ongoing maintenance and additional costs of the assigned officer in charge to maintain the system.

"..The main constraint of E-learning is the financial factor. Training center needs to provide hardware such as computers, scanners, cameras and a perfect software.Computer network should also have a large bandwidth so that the system can be operated without troubles"

Some of the respondents said that the cost factor is the reason why some institutions do not wish to engage with e-learning. In addition, officials said the cost will increase by almost 80% if the training institutions are located in remote areas such as Sabah and Sarawak, districts that have hilly and uneven geography.

"... Rural areas require special equipment such as high-powered satellite transmitter. It is very expensive and require high maintenance costs…"-

Consequently, before implementing the system numerous things need to be noted as vigilant planning should be done so the approved cost will not increase due to overlooked issues and carelessness. Actions such as finding alternatives like using free software, easy data handling (do not require large

databases) as well as the use of methods that are easily understood (without a lot of training) should be incorporated to help reduce costs.

Discussion

After merging and analyzing both qualitative and quantitative data, the statements were compared to existing literature to support and clarify those findings. The literature was obtained from previous projects and research that had been executed previously. The comparisons were tabulated to ease comprehension.

The summary of findings of this study have also been mapped (Figure 1). The main findings such as definition of e-portfolio functions, benefits and issues perceived were illustrated through that figure to ease comprehension.

Table 3: Comparison "Theme 1:-Definition and Function of E-portfolio" with literature.

Findings	Literature Review
Internet based learning, Online learning,	E-portfolio is an instructional product that uses ICT-based e-learning (Mohd Bekri, Ruhizan, Norazah, Faizal Amin Nur, & Tajul Ashikin, 2013). E-portfolio could consist of elements of text, graphics, or multimedia with the accessibility of the web site or other electronic media such as CD-ROM or DVD (Lorenzo & Ittelson, 2005)
Developed on a specific application/ program	E-portfolio may be developed in various types of software where specific e-portfolio packages may have an additional advantage in the generation of web folios (portfolios on the web) and different versions of portfolios for different audiences (Jwaifell, 2013)
Record/work product compilation	Barrett (2005) defined electronic portfolio as the uses of electronic technologies as a container, allowing students/teachers to collect and organize portfolio artifacts in many media types (audio, video, graphics, text). This is supported by JISC where they define an e-portfolio is the product, created by the learner, a collection of digital artefacts articulating experiences, achievements and learning(JISC, 2008)
Communication medium	E-portfolios are easier to use in publishing information and can also be used as a learning tool where users can share ideas and information with other users via online (Mohd Bekri et al., 2013). A few researchers also emphasizes that e-portfolios may support collaborative learning and enhance communication among colleagues (Jaryani, Ibrahim, Sahibudin, Nasab, & Daruis, 2005; JISC, 2008)
Evaluation and assessment	Electronic Portfolios serve as a mean of authentic assessment to demonstrate a teacher's proficiency as well as that of the students.(Jwaifell, 2013)
Tracking/monitoring progress	Paul Manning from Thanet College said in the report on E-portfolio Implementation for Joint Information System Committee (JISC) project : "My NVQ students use their phones to capture evidence of what they have done and then upload it into their e-portfolios. This has really helped the progression among lower achieving students." (JISC, 2012)

Table 4: Comparison "Theme 2:- Benefits of E-portfolio" with literature.

Findings	Literature Review
Enhance learning reflection	The joint discussion that is derived from e-learning reflection was found to assist students in identifying their learning difficulties, thus, increasing understanding, retention and achievement.(Nor, Raja, & Jhee, 2012)
Enhance learning and personal Skills	The e-portfolio shows some learning enhancement (such as improving quality of evidence and feedback, skill development (Joyes, Gray, & Hartnell-young, 2010)
Save resources	The electronic portfolio has many advantages compared to the printed portfolio such as the ability to save and organize material more easily (Mohd Bekri et al., 2013). This may include efficiency (such as time savings for students, academics, and administrators) (Joyes et al., 2010)
Improves social communication	Through e-portfolios students are able to share developing ideas and receive prompt feedback through the dialogic functions commonly found in an e-portfolio (Nor et al., 2012)
Work progress accomplishment	The e-portfolio process allows for the scheduling of periodic progress reviews that can be used to consult learners as well as serve as value added assessment (Buzzetto-more & Alade, 2008). This is agreed by Holton(2006) where e-learning, like the e-portfolio, could assist with monitoring students' participation and progress. This is in line with the Vocational Education Training (VET) concept that students in this course must have to show their progress of learning by small task accomplishment as well as by the end product of their work (Galatis et. al, 2009)

Table 5 : Comparison "Theme 3:- Issues and Challenges of E-portfolio" with literature.

Findings	Literature Review
Implementation cost	Cost was rarely overtly mentioned by contributors to the study. Some of the implicit cost issues included software licenses, storage cost, technical support and facilities and technical maintenance which all need to be considered in early planning (Joyes & Smallwood, 2012)
User attitude and personal skills	Deketelaere et al. (2007) argue that regardless of whether the portfolio is paper or digital, it requires a considerable amount of time and attention to decide how a portfolio would make a difference in the students' learning. The student needs to be motivated and passionate to use this application successfully. Moreover, it is vitally important that IT skill training is provided, which is needed to enable students to create portfolios (Doig, Iilsley, McLuckie, & Parsons, 2006)
System Design	A detailed study should be done to produce an E-portfolio system which is compatible, easy to use, user-friendly, attracts the interest of teachers and students as well as meeting the standard of the vocational education system (Mohd Bekri et al., 2013). Furthermore, the process of deployment also plays an important role to attract users to persistently use this application. As Nor, Raja, & Jhee, (2012) informed from their finding on evaluation of E-portfolio deployment, students and lecturers did not face many challenges in the technological aspect but they faced many challenges in the construction of knowledge and making meaning

	out of the process that they engaged in.
Management Issues	Hallam (2008) reported that in order to sustain and build a strong future for e-portfolios, the management and community in practice should together give full cooperation and support.
Technical assistance	The environment of the system deployment should also consistently support and assist the users (Owen, 2011)
Physical facilities	Lack of users' access to ICT facilities is one the practical barriers to individuals' engagement with the system. (Owen, 2011). The access to IT equipment is essential as is convenient and reliable internet access from home or a study room. For institutions, this brings about increasing demands on IT infrastructure in terms of software, server space, and staff support.(Doig et al., 2006)
Authenticity and reliability	Carliner (2005b) mentioned that authenticity may be one of the challenges in e-portfolio implementation in order to verify the authorized user in term of producing its own artifact or pretends to be somebody else or just copying others people work.

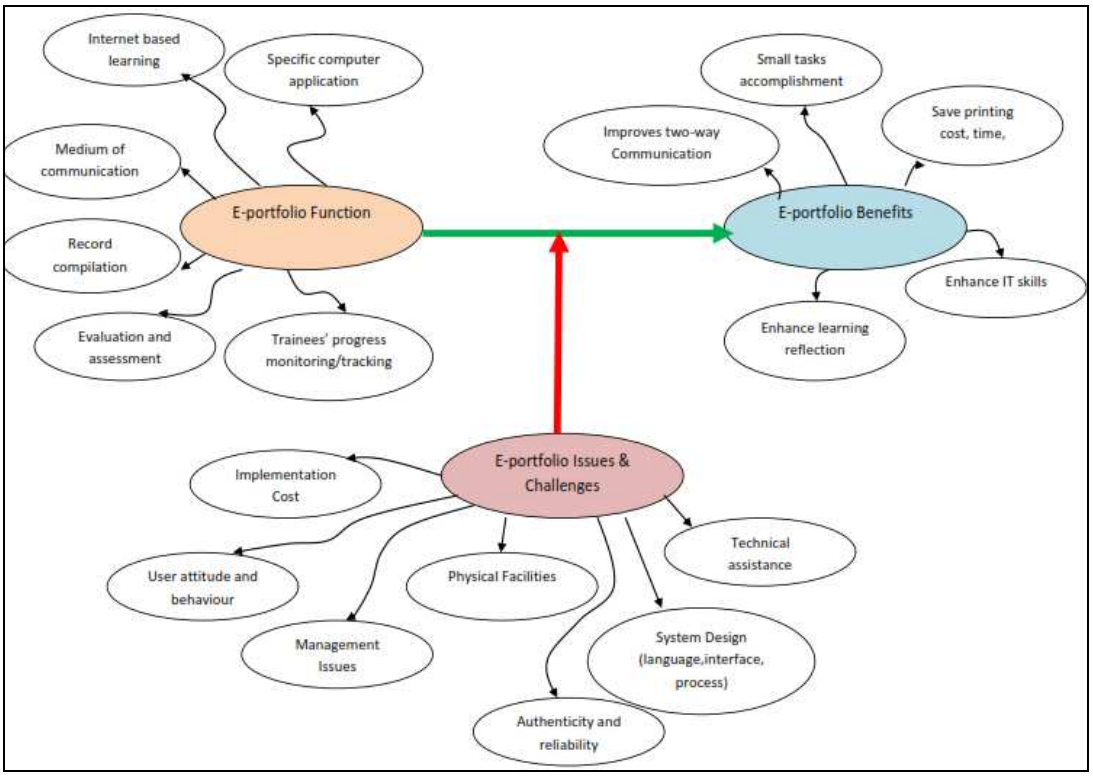

Figure 1: The summary of findings on the perception of E-portfolio development in Malaysia Skills Training Program.

Key principles of developing the Skills Training E-portfolio

The key principles that need to be taken into account when considering implementation of the e-portfolio system are:

The e-portfolio needs to be bi-lingual

that the Malaysian Skills Training program caters for students who potentially have difficulties accessing higher education. Most lack competency in English language. Therefore, the instructions embedded in the application must be bi-lingual in Malay language as well as English.

The support must be inclusive

Inclusive here means peer-assistance, instructor-assistance and technical-assistance. Users need to be provided with continuous support from everyone to ensure that they remain engaged with the e-portfolio application. The developer should be aware of users' problems throughout the deployment process. Training should supply users with a comprehensive manual, relevant documents, and communication with users via video tutorials. The process of deployment needs to be explained to the instructors to enhance their understanding of how to evaluate student's work and to detect and prevent plagiarism and collusion..

Design the e-portfolio process to meet the context in which it is to be used (to all levels)

The diversity of purposes supported by e-portfolios can lead to misunderstandings about the focus of a fresh implementation initiative. The objectives of the implementation of this application should be presented in a package of teaching and training using e-portfolio technology. This is supported from the Becta Case Studies executed by the Nottingham University Research Group, where they suggest that e-portfolios benefit learning most effectively when considered as part of a joined-up teaching and learning approach, rather than as a discrete entity (Becta, 2007). This process should be designed according to the needs of the course and must be adapted to the current pedagogic approach as suggested by Joyes et al.(2010) where the processes involved in the creation of the e-portfolio in the particular context must be understood and both technical and pedagogic support needs to be provided to ensure the success of the system's implementation.

Design the e-portfolio interface to be easy to use/intuitive

The computer application must have an interface and features that motivate the users to continue exploring and using the system (Jaryani et al., 2005). Effective user interface must be easily understood by all users and should have straightforward functions through icon or links. Therefore, the system should be designed to show all primary functions on the main screen right after the user logged in.

The facilities must be sufficiently provided

Hardware devices (i.e., computers, laptops) and established internet lines are the most important things to be supplied to the students. Additional peripherals like digital camera, webcam, speaker and microphone should also be provided.

Low cost application and technical maintenance

Many institutions, especially privately owned colleges were reluctant to invest in the licensed software application because the cost will continue to be incurred by them throughout the implementation. So, the open-source application will be the best choice to consider due to less maintenance and no requirement to

purchase the license. However, the institutions still need to spend on the server host to store the system's data as well as students' work.

Support and motivation from all

Institutional managers should see this project as important as other training pedagogies. The qualification body should recommend and encourage the training centers to engage with this project so that it will become a noteworthy project for the Malaysian Skills Training Program. It will improve the motivation of the users to continue engaging with the system in future.

Conclusions

Malaysian skills training has made various improvements and changes in the content and mode of delivery of training modules. The time is now right to introduce an electronic learning system to the trainees beginning at level 1 and working through to level 5. It is evident that all interviewees were in agreement that all programs included in Skills Training should be standardized by using an electronic learning system to facilitate monitoring and maintenance of the trainees, as well as to increase public awareness and recognition. The e-portfolio system has received positive feedback from various groups such as senior officers at the ministry, principals, instructors as well as students of the training institutes. Statistics from a survey questionnaire of students' attitude towards e-portfolio implementation also showed that its introduction to the Skills Training Program is supported. Despite the positive results, there are several constraints that need to be addressed and taken into account such as implementation costs, technical requirements, physical facilities, support and assistance as well as the authenticity issues concerned with students' work to ensure that these applications are successfully deployed. This system will hopefully help the trainees to be more reflective in their learning and allow them to focus clearly on the objectives of their courses in line with the competency standards set by the Malaysian skills training quality department.

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