The Development of an e-Portfolio for Competency based Training Assessment for a Malaysian Skills Diploma Program

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Abstract: This paper presents a comprehensive Electronic Portfolio (e-Portfolio) Framework developed for Competency Based Training (CBT) assessment in a Malaysian Skills Diploma Program which is certified by the Ministry of Human Resources in Malaysia. The proposed framework is adapted from an existing assessment system, which was outlined by the Ministry of Human Resources with the addition of other features from current E-Portfolio technologies. The aim of this study is to present a new comprehensive framework that contains a combination of e-portfolio applications that align with the current methodology of CBT assessment as a blended approach to formative assessment. Senior officers at the Ministry of Human Resources, Principals and Instructors of Training Institutes have been questioned via the medium of email based interviews to establish their views on the need for this kind of e-Portfolio as well as the possible constraints that would be faced. All interviewees agreed that the e-Portfolio is well suited for implementation as an evaluation method to improve the IT skills of the students. However, they also highlighted constraints that should also be considered before implementation to ensure this system will be effectively installed and completely functional.

1 INTRODUCTION

Competency-Based Learning/Training (CBL/T) is a current method used to bring together the gap between learning in educational settings and future workplace performance, which represents a challenge for institutions of higher and further education (Sluijsmans et al., 2006). In competency-based learning methods, the models and learning strategies used must be able to encourage reflection and reactions from students in an effort to solve the problems and challenges they face during training. The students are often tested with problems that require skills and knowledge based on previous experience or what they have learned. Competence is important so that students will master the skills needed in 'real world' industry (Bastiaens, 2010). Technically, in CBT students need to collect proofs of their skills during training so that their competence can be recognised. Normally in developing countries, evidence collection is done manually through the compilation of a paper based file. Research into the use of electronic portfolios in developed countries in higher and further education indicates that there are potential benefits to the use

of e-portfolios. The main aim of the e-portfolio is to encourage inclusive learning with the use of ICT technology and promoting learning ownership for students or trainees as well as instructors. This paper proposes a framework for adapting the concept of CBT in the e-portfolio for Skills Training program in Diploma Courses that allows this system to be embedded in training methodologies. There are many potential benefits to be gained through the use of e-portfolios in CBT; such as an improvement in industrial recognition of the product of students' work, encouraging an active learning environment, as well as cultivating the IT skills of students whilst completing assignments. Moreover, the instructors could also monitor the performance of students through their e-portfolio progress to take proper steps to support students who experience problems. The development of this framework can also be a guide for any institution or any parties who intend to use an e-portfolio in their training program.

2 COMPETENCY BASED TRAINING (CBT)

In Malaysia, the Skills Training Program was developed in alignment with this CBT approach. These programs were organized and coordinated by the National Vocational Training Council under the jurisdiction of the Ministry of human Resources. To implement CBT, a national occupational skills standard (NOSS) was developed. For every NOSS-based training program, the learning outcomes to be achieved are stipulated in the task profiles of the NOSS, which include performance standards to be met at the end of the training program (Sachs, 1998). The training objectives, or outcomes, are specified and made known to trainees in advance so that trainees can progress at their own optimum rate. In other words, the duration of time spent on training can be a variable but the learning outcomes to be achieved are considered to be constant (NVTC, 2001, p.8). The focus on outcomes is clearly reflected in the interpretation of the 'competency' concept that underpins the training system based on NOSS in Malaysia:

"The concept of competency focuses on what is expected of a worker in the workplace rather than on the learning process. It embodies the ability to transfer and apply skills and knowledge to new situations and environments" (MLVK, 1995, p.1).

The outcome-based orientation of the competency-based approach is usually characterized by its strong emphasis on assessment. This can be seen from an interpretation of assessment which is typically used in competency-based training as the "process of collecting evidence and making judgments on the extent and nature of progress towards the performance requirements set out in a standard, or a learning outcome" (Hager et al., 1994, p.5). By adopting the competency- based approach, the training system based on NOSS in Malaysia clearly favours an outcome-based orientation. This orientation has been accentuated by the implementation of a national skills certification system which adopts a criterion- referenced assessment approach, focusing on performances as the key basis for assessment and certification (NVTC, 2001, p.4).
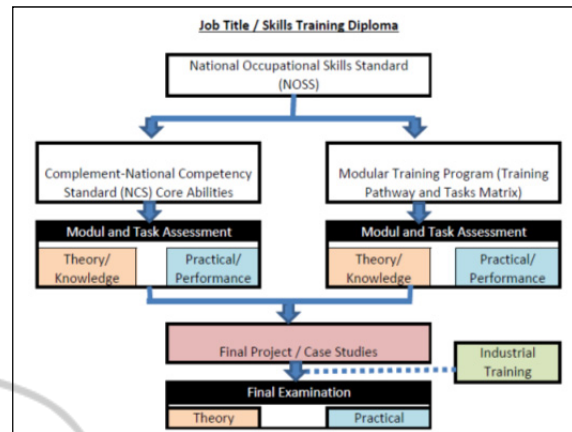

Figure 1: Existing CBT Assessment Process in Malaysia Skills Diploma Program.

Figure 1.0 shows the process of assessment in the Malaysian Skills Training Diploma. Each student must meet the criteria of competence in modular training programs as well as in the complement/elective programs. They also need to accomplish the final project and six months of industrial training before they are qualified to be awarded with the Diploma certificate. All assignments, documents and evidence of competencies are compiled in a large file called the student portfolio.

3 E-PORTFOLIO

e-Portfolios can be defined as "a personal, web-based compilation of work, assignment feedback, and reflection used to indicate key skills and achievements in a variety of contexts and time periods" (Barrett, 2005); (Reardon et al., 2005); (Turhan and Demirli, 2010). This collection consists of elements of text, graphics, or multimedia which can be accessed through a web site or other electronic media such as CD-ROM or DVD. The learning portfolio is a flexible, evidence-based process that combines reflection and documentation. It engages students in ongoing, reflective, and collaborative analysis of learning. It focuses on purposeful, selective outcomes for both improving and assessing learning. In vocational and education training which employs the Competency Based Training approach, few countries have implemented this application as part of their e-learning education support program. The use of a portfolio is an alternative form of learning and assessment that is particularly attractive to vocational educators

because it includes the assessment of active learning and performance rather than the mere recall of memorized facts (Turhan and Demirli, 2010). 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 showed that both teachers and students found the e-portfolio process was necessary in vocational education as part of the learning session. The outcomes of a Leonardo da Vinci project (MOSEP - More self-esteem with my ePortfolio) showed that E-portfolios can be used as a technology supported learning method for the documentation of competency development (Hallam, 2008). This project outlined a new training concept for teachers and tutors using open source e-portfolio software tools.

4 E-PORTFOLIO IN MALAYSIAN SKILLS TRAINING PROGRAM

The Malaysian Skills Certification Program does not currently make use of any Virtual Learning Environments (VLE) such as e-portfolios or any training applications implemented in public or private training institutions. However, some countries such as the USA (Abrami et al., 2008); Lorenzo et al., 2005) UK (Madden, 2007) , Australia (Gerbic and Maher, 2008); (Hallam, 2008), Portugal (Queirós et al., 2011) and the Netherlands (Bastiaens, 2010) have adopted various types of specialized VLE for students in higher education including the Vocational Education Training (VET) sector enhance the quality of the program and to appeal to parents and prospective students. To obtain views regarding the development of e-portfolio in Malaysian Skills Training Programme, an interview was conducted as part of this project to assess the opinions of five senior officers from the Department of Skills Development, Malaysia Ministry of Human Resource, two managers of Private Accredited Centre that run Malaysian Skills Training Program under the Department of Skills Development; and three instructors cum verifier officers of Accredited Centre that teach Skills Training Programme (two were from the private institutions and one was from Public/Government Institution).These interviews were conducted via email and the questions related to an evaluation of current methods of portfolio documentation, views on the need for a VLE, and any barriers to implementation that they could predict. According to senior officers, Department of

Skills Development (DSD) Ministry of Human Resource at the moment is in the process of developing a system of ICT applications, which are known as the National Skills Credit Bank System. This system intends to upgrade the Skills Training Program to adopt information technology into the learning and training methodology (Dollah et al., 2012). While the instructors and the principals stated that their campus, currently has not applied a VLE, they do utilize a common system for recording student grades and observations on the performance of trainees (Abd Aziz and Haron, 2012); (Zulkefli et al., 2012). Analysis of the interviews highlighted several reasons why e-portfolios should be introduced to trainees. The requirements were based on the situation and circumstances as follows (1) To upgrade the skills training program to be at par with professional training programs that are recognized by well-known organizations in and outside the country; (2) To promote skills training to youth and adults with increasingly interested in the field of information technology in line with the current technology; (3) To facilitate monitoring of the certification body so that the training process and requirements of the learning outcomes of the training centers' and the trainees will be conformed according to the standard set.; and (4) To facilitate the training program in providing promising opportunities through links with other programs in other institutes as options for the trainees' further education path.

Moreover, according to the instructors, teenagers now prefer a more flexible training environment and on-demand learning. They prefer reading materials and references that give more insight into professional reality than traditional textbooks. Thus, e-learning has the potential to motivate students to explore the internet to find constructive and beneficial information relating to their learning rather than wasting time visiting social sites and playing video games (Zulkefli et al., 2012). The Principal of the training center also agreed to implement e-learning such as the e-portfolio in the training system mainly to provide the performance report and results of the trainees to parents or a third party. This system will also maintain the quality of learning and training by upgrading and enhancing the training methodology in line with current learning technologies. Regarding the costs to be considered, they understand that in order to implement any kind of reform process, costs and risks will certainly exist. These costs can be considered according to the needs and current situation (Abd Aziz and Haron, 2012). In

conclusion, the results of interviews with various parties involved in the skills training program showed that there is general agreement that the e-portfolio should be implemented in the program to the advantage of trainees, instructors, the awarding body, parents and any other parties that are directly or indirectly involved with skills training based education. Furthermore, they suggested other kinds of e-learning methods, which may have various benefits for instance a learning management system or mobile learning.

4.1 Proposed CBT Blended Assessment Model

The purpose of developing this E-portfolio is to enhance current assessment methodologies in the Skills Training Program to a method called CBT Blended Assessment. This blended assessment will combine online participation as well as face-to-face evaluation by students. For online participation, students have to create an electronic portfolio in the system provided. Figure 2.0 shows components of assessment that will be involved in the E-portfolio system in CBT Blended Assessment Model.
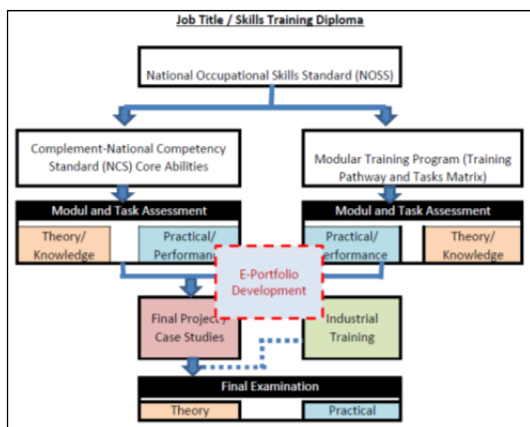

Figure 2: Proposed CBT Blended Assessment Model in Malaysia Skills Diploma Program.

4.1.1 e-Portfolio Development Framework

The purpose of the CBT e-Portfolio Framework development is to pave the way for the development of well planned and organized specific e-portfolio for CBT. A framework of e-portfolio based CBT is developed based on criteria of CBT. This framework consists of three elements which are **modules and task performance objectives**, **performance assessment** and construction of **trainee's e-portfolio** for each module.

Module and Task Performance Objectives: Each module has several tasks that should be accomplished by the trainee in order to achieve competence. The modules have certain performance objectives as well as containing tasks. These objectives will be aligned with a skills and competencies matrix for respective modules. Trainees must comprehend this matrix in order to plan the progression of their work. *Performance Assessment:* Each module must have a complete set of performance assessments to audit skills competencies. This assessment must allow formative as well as the compulsory summative assessment. A *formative evaluation* (sometimes referred to as internal) is a method for judging the worth of a program while the program activities are *forming* (in progress). CBT learners must know the work process in solving a given task. Therefore, they have the responsibility to work through the process in the correct order. Progress must also been evaluated and commented on with the aim of raising learning standards. *Trainee's e-Portfolio:* After completing the phases such as identification of skills competencies and assessment needs, trainees can begin to construct a collection of pages for each module. Each module collection must contain the skills matrix, progress of work and the completed final work. The skills matrix is also used as a performance rubric or field monitor for the instructor to identify the level of competence of trainees for each given assignment. In the student's personal e-portfolio account, they must include all documentation, instructions and resources. Table 1.0 shows an example of evidence required in the e-portfolio.

Table 1: Examples of Contents in e-Portfolio.

Types of Content	Content
Instruction	Question Paper, Work sheet
Documentation	Skills Matrix, assignments, Project Paper, On Job Training log book,
Resources	Video, audio, images, industry testimonials
Personal	Profiles, Plans, Resume, Groups, links

5 RESULTS OF PILOT TEST

A three months pilot test of E-portfolio system had been implemented to a group of students from one private Skills Training Institute in Malaysia. The pilot session involved 23 students and 2 instructors which are from Diploma Skills in Culinary Art

Program. The scope of this session begins with both student and instructor will sign up for a personal account and fill the basic information required, instructor then publish a performance assessment question with dates of submission/progress, student starts to develop plan using 'PLAN' function in the system and insert the dates given as well as the other content like materials for assignment preparation, student place their progress of work in their personal E-portfolio account and finally get feedback from the instructor. From the analysis based on user statistics in E-portfolio monitoring system, all 23 students were successfully signed up on to the system. However, only 15 students were involved in assignment tasks with only 60% from them submitted until final submission. Then, students were given a questionnaire that asking their opinion about how they perceived about the system. From 23 students overall, only 8 students were filled in the online questionnaire provided. Below are the summary of the participation in the pilot test session.

Table 2: Summary of Students' Participation in e-Portfolio Pilot Test.

Activity	No of Student Participated	Percentage (from total students in class)
Signed Up Process	23	100%
Reflect on the assignment post	15	65%
Take part in review process	8	35%
Final Submission	9	39%
Fill up the online questionnaire	8	35%

Result from questionnaire is presented in the histogram (Refer Figure 3.0). Majority of these graphs were representing the modes of frequency after accumulating the result from sub-questions. There are eight main questions asked which are Perceived Usefulness, Perceived Ease of Use, Computer Self-Efficacy, Image, Facilitating Conditions, Competence Expectancy, Perceived Playfulness and Behavioral Intention in 5 scales rating questionnaires *(1:Strongly Disagree, 2:Disagree, 3:Neither agree or disagree, 4:Agree, 5:Strongly Agree)*.

Overall, by refer to the histograms of Perceived Usefulness, Image, Competence Expectancy and Behavioral Intentions, majority of students agreed that the E-portfolios are useful to facilitate the assignment completion and recognize the key competencies required for the module. In addition,

they also agreed that by using this system, they can enhance their image into a technologically advanced student. Ultimately, they decided to continue to use the system during the course and will invite their friends to join using this system in the future. However, for technical support issues, only some of them felt that there is a support team available to assist when in problems while others favor neutral. The same result shows on issue Perceived Playfulness which was only partially felt that by using this E-portfolio system will adds more pleasure and joyful during the training courses.

On the other hand, it can be found that most of the students were having moderately skills in computer usage and application. This was evident when many of them choose intermediate for Computer Self-Efficacy issues. In the same case, the issue of Perceived Ease of Use also showed moderate rating for mainly students. This clearly indicates that with low skills in computer applications, this system viewed rather difficult to use during training.
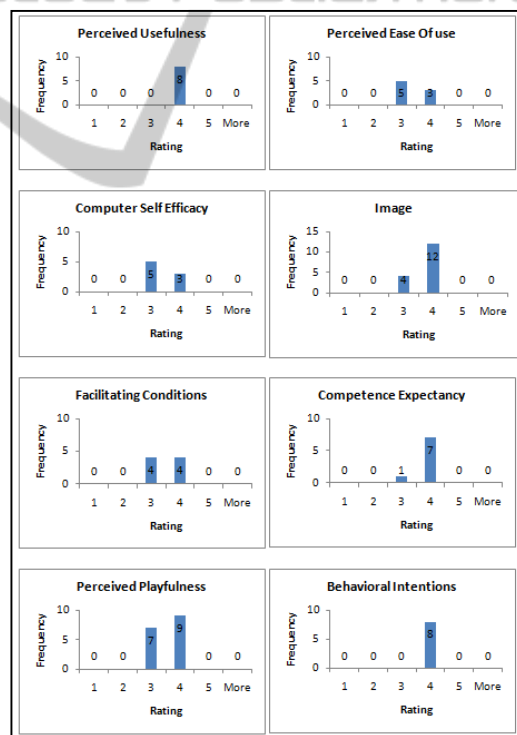

Figure 3: Result of questionnaires.

6 IMPLEMENTATIONS ISSUES AND CHALLENGES

Senior officers stated that the main constraint to

implementation of a VLE or online learning for these training programs is difficult in getting internet access services in remote areas such as Sabah and Sarawak and the upstream side of the village in the peninsula. The instructors' opinions were that any kind of system could be implemented but it would require a longer time to familiarize trainees to internalize the system due to the attitude and skills or weaknesses in the trainees themselves in terms of adopting these technologies. Principals also stated that in order to implement the reforms, many things need to be considered by various parties, such as time, cost and manpower. All of which has to be approved by various levels of meetings with stakeholders. In addition, the system development process also requires review and comprehensive study to produce a system that really functions and satisfies the end user. Therefore, these constraints should be considered before making the decision to implement e-learning. These are summarized as follows: (1)The supply of hardware resources such as computer equipment, internet, network, servers and other hardware involved in every centre that participates; (2)The provision of software and applications must be easy to develop and maintain as well as low in cost if licensed; (3) Intensive training to trainees and all institutional personnel or departments which will be involved with the system; (4) Moral and financial support from the stakeholders and management; and (5) Costs like resources, manpower and time periods should be considered from the beginning of a process of planning, implementation, testing up to the assessment of effectiveness.

7 CONCLUSIONS

This paper has presented proposed changes to the current evaluation model in Malaysia Skills Training Diploma to a new CBT blended assessment model which adopts the concept of an e-portfolio. This e-portfolio system has received positive feedback from various groups such as senior officers at the ministry, principals and instructors of the training institutes. Numerous people have proposed that there may be advantages to the student like time and cost saving, enhancing student's active learning and giving students access to the latest learning technology. Although there are several constraints that need to be addressed and taken into account such as the high cost of short and long term investment for the facilities and equipment, lack of student's and instructor's awareness as well as the

political intervention, these people believed that the new model would be of benefit and successful. Proposals to develop e-portfolios have full support from all parties involved with the Skills Training program in Malaysia. This system will hopefully help the trainees to be more reflective in their training and deepen the objectives of their courses.

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