Developing and Evaluating an E-portfolio For the Final Year Project (FYP)

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Introduction

An electronic portfolio provides an environment where students can: collect their work in a digital archive, select specific pieces of work (hyperlink to artifacts) to highlight specific achievements; reflect on the learning demonstrated in the portfolio, in either text or multimedia form; set goals for future learning (or direction) to improve; and celebrate achievement through sharing assessment. Teachers (and peers) can review the portfolio document, and provide formative feedback to students on where they could improve (Barrett, 2006). The main idea of using an e-portfolio "… is to keep students focused on learning rather than on individual projects or products – e-portfolios are part of the learning process, not a result of it" (Garthwait & Verrill, 2003, p. 23). E-portfolio assessment has decreased students' stress and increased their self-confidence. This finding shares the same point of view with Solomon (2003) and Frank and Barzilai (2004). There are two major types of e-portfolio: positivist portfolios and constructivist portfolios.

Positivist portfolios

The purpose of the portfolio is to assess learning outcomes and those outcomes are, generally, defined externally. The portfolio is a receptacle for examples of student work that is used to infer what and how much learning has occurred (Knutzen, 2006) [6].

Constructivist portfolios

The portfolio is a learning environment in which the learner constructs meaning. It assumes that meaning varies across individuals, over time, and with purpose. The portfolio presents process, a record of the processes associated with learning itself; summation of the individual portfolio would be too complex for normative description (Knutzen, 2006) [6].

The positivist approach puts a premium on the selection of items that reflect outside standards and interests. The constructivist approach puts a premium on the selection of items that reflect learning from the student's perspective (Paulson & Paulson, 1994) [8].

Many of the current leaders in research on portfolios are attempting to balance the educators' need for an assessment management system with the needs of learners for a reflective portfolio. This new conceptual framework must satisfy both the positivist need for a portfolio as a receptacle which indicates how learning standards are being met, and the constructivist need for a portfolio as an intrinsic focus which excites and inspires the learner (Knutzen, 2006) [6].

The present study aims to incorporate two approaches of e-portfolios, called blended e-portfolios, to evaluate the student learning process and to enhance their learning effectiveness during the final year project (Figure 1). For the positivist paradigm, two concept lists of the course on 'Research in Childhood" which students had undertaken in year 3 were given to all three groups (Experimental group – SN, Control group – SN, and Control group – Non-SN) in week 1 and week 6 respectively. They were required to take two online quizzes in week 5 and week 9. The key concepts of the research methods were revisited between week 1 and week 5, and between week 5 and week 9 by the tutors in all groups. Only the experimental group (SN) and control group (SN) were uploaded reading materials about research methods on e-learning, and students in both groups (SN) were encouraged to download the materials when necessary. The control group (SN) was called the positivist e-portfolio group. For the constructivist paradigm, students in the experimental group (SN) were encouraged to upload materials, literature, or video clips related to their research topics on e-learning to share. The observation video clips collected from the project were also uploaded onto the e-learning to share how they recorded children's behavior in the kindergartens. The experimental group (SN) was then called the blended e-portfolio group.

Chang (2001) [2] suggested conducting a further experimental study in terms of learning effectiveness for the web-based learning portfolio. The College Learning Effectiveness Inventory (CLEI) was used to assess the students' learning effectiveness before and after using blended e-portfolios.
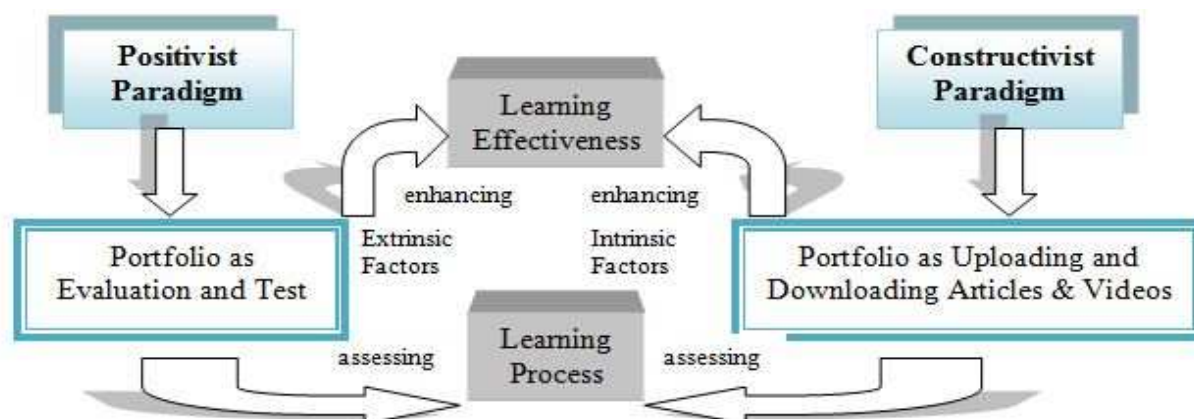
Fig. 1. Blended e-portfolio model

Method

Participants

All subjects were final year students in Early Childhood Education taking the course on "Research in Chidhood" in year 3 before taking the final year project. All were females aged from 22 to 24.

Instrument

The CLEI is an inventory devised by a group of researchers at Kansas University (Newton et al., 2008). It comprises six scales and 50 questions for measuring the factors that impact on student learning. The six scales include academic self-efficacy (ASE), organization and attention to study (OAS), stress and time press (STP), involvement with college activity (ICA), emotional satisfaction (ES), and class communication (CC). Participants rate their learning approach and attitude on a five-point scale, from 1 (*Never*) to 5 (*Always*).

Design and procedure

All three groups, the experimental group (SN), control group (SN), and control group (Non-SN), were given an assessment on the first and sixth week of the first semester to see what were the key concepts and research skills they had learnt in "Research in Childhood". Online True/False quizzes were given in the fifth and ninth week to evaluate how many key concepts and research skills they really understood. The lecturer revisited the concepts and knowledge of research methods during week 1 to week 4 and week 6 to week 8. Both the experimental group (SN) and control group (SN) were asked to download the materials and articles on research methods from the e-learning for revision. The e-learning system would record how many materials they had downloaded.

Students in the experimental group (SN) were also encouraged to upload materials, literature, or video clips related to their research topics on e-learning to share. The observation video clips collected from the project were also uploaded onto the e-learning to share how they recorded children's behavior in the kindergartens.

The control group (SN) receiving a positivistic e-portfolio (online reading materials, articles, evaluation-based teaching, and project supervision) was called the positivistic group, while the control group (Non-SN) only receiving the lecturer's supervision was called the control group. The experimental group (SN) that received the positivist e-portfolio and constructivist e-portfolio (upload materials, literatures, or video clips related to their research topics for sharing) was called the blended e-portfolio group.

Data analysis

ANCOVA was used to examine the learning effectiveness among the three groups with or without using e-portfolios (Experimental group – SN, Control group – SN, and Control group – Non-SN), with the Time 1 scores of learning effectiveness of the three groups as a covariate.

Result

Enhancing students' learning effectiveness using the e-portfolio

An analysis of covariance was used to examine whether the students in the experimental group outperformed those in the control group regarding the improvement in learning effectiveness. As seen in Table 1, the Time 1 subscales of Academic Self-Efficacy (ASE), Organization and Attention to Study (OAS), Stress and Time Press

(STP), and Class Communication (CC) are the non-significant covariates in the ANCOVA. The Time 2 CLEI results, after taking the Time 1 CLEI scores as covariates, indicated no group differences were found in learning effectiveness after using the e-portfolio in the experimental group (SN).

However, when we looked at the graphical presentation of the three groups in the four subscales of CLEI between Time 1 and Time 2 (see Figures 1 to 4), the mean scores of CLEI of the experimental group (SN) in the subscales of ASE, OAS, and CC in Time 2 were higher than in Time 1. The results indicated that students in the experiemental group (SN) reflected higher anticipation of goal achievement and outcome, more effective goal-planning, and more reluctance to join in class activity after using the e-portfolio in their final year project. Even in the subscale of STP, the mean scores of the three groups fell from Time 1 to Time 2; the experimental group (SN) from 19.0 to 18.5, the control group (SN) from 20.0 to 18.7, and the control group (Non-SN) from 19.3 to 17.0. This showed that the control group (Non-SN) reflected the lowest efficacy in handling stress in Time 2 among the three groups. Importantly, the non-significant ANCOVA results were due to the individual differences in groups, and because of the small sample size in each group, it was necessary to perform within-subject analysis to examine the individual differences among the three groups between Time 1 and Time 2 in learning effectiveness.

Table 1. ANCOVA for enhancing learning effectiveness using the Time 1 scores as a covariate
Learning Effectiveness (College Learning Effectiveness Inventory)

| Source	df	MS	F	p	eta^2
Academic Self-efficacy (ASE)					
Time 1 scores	1	34.04	1.35	>.05	0.04
Groups	2	49.64	1.96	>.05	0.11
Error	32	25.28			
Organization and Attention to Study (OAS)					
Time 1 scores	1	3.63	0.36	>.05	0.01
Groups	2	5.06	0.50	>.05	0.03
Error	32	10.05			
Stress and Time Press (STP)					
Time 1 scores	1	19.90	2.05	>.05	0.15
Groups	2	25.07	2.72	>.05	0.06
Error	32	9.23			
Class Communication (CC)					
Time 1 scores	1	13.13	2.64	>.05	0.08
Groups	2	6.27	1.26	>.05	0.07
Error	32	4.96			
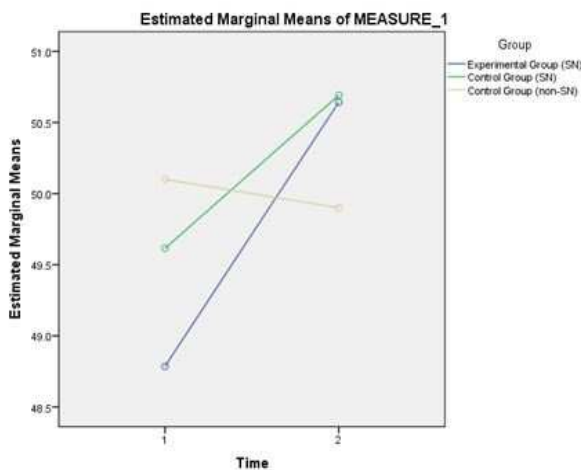
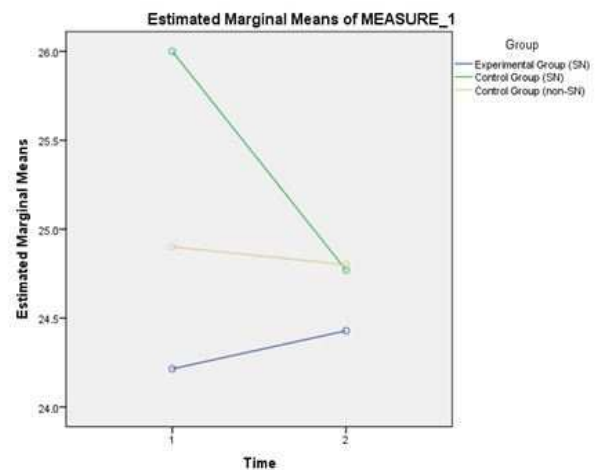Fig.1. Time 1 & Time 2 difference of
Academic Self-efficacy

Fig.2. Time 1 & Time 2 difference of
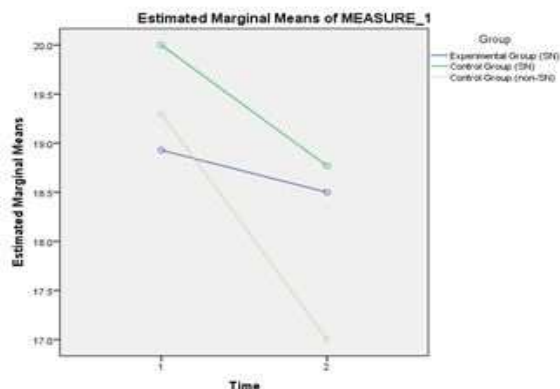Organization & Attention to Study

Fig.3. Time 1 & Time 2 difference of
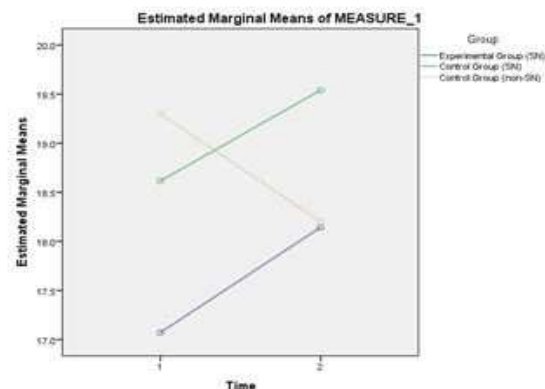Stress & Time Press

Fig.4. Time 1 & Time 2 difference of
Class Communication

Discussion

Enhancing learning effectiveness through the e-portfolio

Learn better with evaluation-based teaching

Students in both the experimental group (SN) and control group (SN) performed better in the quizzes than the control group (Non-SN) did. This implies that the positivistic e-portfolio provides an opportunity for students to download the reading materials and to pay attention to the lecturer's revision on the concepts of research methods. The online quizzes offer an extrinsic factor to motivate the students in the two SN groups to use a positivistic e-portfolio to promote their learning process.

Learning effectiveness is intrinsically motivated by the blended e-portfolio

Most students in the experimental group gained higher scores in ASE, OAS, and CC. Simply speaking, the blended e-portfolio, especially in the contructivistic paradigm (sharing video clips and observation records within the groups) could enhance class communication and attention, and goal planning for the project could also be promoted with better class communication. This may lead to better time and stress management for the study. In other words, possibly owing to lack of attention and avoidance of goal planning at the end of the semester, most students in both control groups (SN and Non-SN) scored lower in CC at the end of the semester, which may reflect reluctance to join in class activity. Students in these two groups focus more on their project write-up than on goal planning and class activities, since the project deadline is drawing nearer. It was found that learning effectiveness is intrinsically motivated by the blended e-portfolio.

Suggestions

Enhancing learning effectiveness with blended e-portfolio approach

It is suggested that a blended e-portfolio which can facilitate students to attain the intended learning outcomes should be designed and adopted (Willis & Kissane, 1995 [12]; Towers, 1996 [11]), can enhance students' generic and specific skills, and improve both the student's and the teacher's perception of teaching and learning. Practically, the use of a blended e-portfolio can help teachers decrease their use of exercises and/or quizzes to grade workloads, provide immediate feedback on improving teaching and learning effectiveness, evaluate students' learning process, and motivate students to learn both intrinsically and extrinsically.

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