Chapter 18

EXPLORING THE VIEWS OF PRE-SERVICE TEACHERS ON THE USE OF THE E-PORTFOLIO AS A LEARNING PLATFORM

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ABSTRACT
In the educational context, the e-portfolio provides a platform for social interaction between learners, allowing them to record, share and reflect upon their learning and achievements, thus encouraging greater ownership of learning. This study assessed users' perceptions of the e-portfolio in a number of domains, with investigations on the e-portfolio's effectiveness as a learning tool and whether it enhanced self-regulation and motivation to learn. The study involved around 326 pre-service teachers enrolled in the initial teacher education program at the National Institute of Education, Singapore. The participants used the open-access Google Site as the platform for their e-portfolios in the course of their one-year program. The institution provided the pre-service teachers with technical support and guidance on how to build, maintain and use their e-portfolios. A survey was administered at the end of the program to assess the participants' perceptions of the e-portfolio in terms of its usefulness, and ability to enhance learner motivation. Generally, the study revealed that the student teachers understood the value of keeping their e-portfolios, and this was one of the key motivating factors for e-portfolio usage.

Keywords: e-portfolio, pre-service teacher, motivation, self-determination theory, platform usability.

1. INTRODUCTION

The surge in commercially developed and free open-source applications in Information and Communication Technology (ICT) has resulted in a corresponding increase in the development of e-portfolios by organizations and individuals. E-portfolios have been used for a wide variety of purposes such as repositories of information, for charting personal or organizational development, for showcasing work and achievements, and for assessment and evaluation. In the domain of teacher education, the need to improve quality, to attain established standards, and to resolve accreditation issues have led to the increased use of e-portfolios in many European states and others around the world (Granberg, 2010). Anderson and DeMeulle (1998) found that the e-portfolio promotes student learning and development, encourages student self-assessment and reflection, provides evidence for assessment and accountability, and documents the growth of pre-service teachers. Finally, the e-portfolio provides a platform for social interaction between users and viewers, allowing comments and feedback from peers, tutors, parents, administrators and employers.

2. BACKGROUND

2.1. Users' Perceptions

In education, e-portfolio usage has received increased recognition in recent years and many authors have written about its multiple benefits to users. For instance, Banks (2004) viewed the e- portfolio as providing a learner-centered view of learning and hence a channel for learners to take ownership of their learning. Along this line, other researchers have explored pre-service teachers' perceptions on the use of the e-portfolio. Yao, Aldrich, Foster, and Pecina (2009) explored pre-service teachers' views on the e-portfolio in the development of their reflective skills and for initial teacher certification. Although the participants involved understood the use of the e-portfolio for record-keeping and for developing their reflective skills, they thought further refinements were needed to make the portfolio reflection more meaningful. In a different study, the participants not only recognized the potential value of e-portfolios, but reported improvements in both academic and personal performance, as well as in their development of knowledge in teaching and learning (Bataineh, Al-Karasneh, Al-Barakat, & Bataineh, 2007). Other pre-service teachers who developed their own e-portfolios felt a sense of accomplishment in being assessed in a more authentic way, and viewed technology use as essential (Wilson, Wright, & Stallworth, 2003). Torras and Mayordomo (2011) studied the relationship between the techno-pedagogical design of an electronic portfolio (Transfolio), the teaching presence in relation to its use and the ensuing student regulation processes. They found that patterns of co-regulation and self-regulation characterized the teaching–learning process, with emphasis on the techno-pedagogical support provided by the teacher, namely in terms of its nature, presentation and importance in the teaching– learning process.

2.2. Challenges in E-portfolio Usage

In spite of the good that has been said about e-portfolios, some researchers prefer to take a cautionary stand with regards to its widespread application. Mark Stiles (2011), for instance, advises those who champion e-portfolio usage against "believing in one's own propaganda", and highlights the "need to understand the challenges and barriers" that they confront. Niikko (2002) investigated the profiles and attitudes of five Finnish kindergarten pre-service student teachers toward the use of e-portfolios. It was found that though the students were interested in working on an e-portfolio and acknowledged its importance, they lacked the resources, time and energy to do so. Rossi, Magnoler, and Giannandrea (2008) reported that the benefits of e-portfolio use are undermined by users' the lack of motivation, the demands in terms of time and effort in the creation, upkeep and revision of the e-portfolios, and at times the inflexible nature of the tool.

2.3. Students' Motivation in E-portfolio Usage

It is clear that student motivation is one of the major factors influencing the widespread use of the e-portfolio in teaching and learning. Unlike Rossi et al. (2008), Driessen, Muijtjens, van Tartwijk, and van der Vleuten (2007) showed that student motivation towards web-based portfolios was significantly higher than paper-based portfolios ($p < 0.05$; effect size 0.76). Chang (2009) found that the implementation of the web-based portfolio assessment system had a greater impact on low motivation students, with regards to their self-evaluated learning effect and perceived usefulness of the system.

Motivational theories attempt to explain how behaviour is initiated, influenced and modified. As such they add to our understanding of the factors that prompt and sustain student teachers' use of the e-portfolio. The self-determination theory (SDT) was chosen

for this study as it provides the best theoretical fit with regards to explaining the important constructs underlying the use of on-line applications such as the e-portfolio (Deci & Ryan, 1985). The SDT provides a suitable framework for the understanding of the motivation behind volitional behaviours (Deci & Ryan, 1985). The theory posits that humans are active in their pursuit of behaviours and activities which will result in positive growth and a unified, coherent sense of self (Deci & Ryan, 1985; Deci, Vallerand, Pelletier, & Ryan, 1991).

Motivational regulation is perceived as ranging across a spectrum, with the total lack of motivation (amotivation) at one end, and at the other, intrinsic motivation (self-initiated and arising from personal satisfaction). Between the two extremes is a range of motivational regulations that are deemed extrinsic, which describes an activity undertaken as a means to an end. In SDT, extrinsic motivation is defined as a multidimensional construct, comprising different types of external motivational regulations, each reflecting a different causal attribution for the chosen behaviour. They are termed external, introjected and identified forms of regulation. External regulation refers to behaviour that is controlled by external means, such as rewards, penalties/punishments or external authority. Introjected regulation refers to behaviour that is internally controlled, self-imposed, and ego-protective, such as acting out of guilt or in an attempt to avoid guilt, and is characterised by feelings of internalised pressure, such as "I ought to…". For identified regulation, the behaviour is self-determined and according to what one values as important. It is characterised by feelings of 'want' rather than 'ought'. These extrinsic and intrinsic behavioural regulations form a continuum that characterises the degree of internalisation of the behaviour, and can be assessed by scales such as the Perceived Locus of Causality scale (PLOC) developed by Ryan and Connell (1989).

2.4. The E-portfolio Platform

Nielsen (2012) suggested that an interface can be evaluated in terms of five quality components:

- learnability or user-friendliness (whether users find the system easy to use at the first try);
- efficiency (how fast users are able to perform tasks with the system once they have learned it), have stopped using it for some time);
- memorability (how easily users are able to re-establish proficiency after they have stopped using the tool for some time);
- error management (the incidence and seriousness of errors made by users and the ease of recovery from errors);
- satisfaction (whether users find the system pleasant and enjoy using it).

In this study, the e-portfolio platform will be evaluated in terms of its user-friendliness, efficiency (inclusive of error management), and user satisfaction. It will not be feasible to assess the system in terms of its memorability, since the participants will be using the e-portfolio on a continuous basis throughout the duration of the programme.

3. METHODS

3.1. Research Questions

The aim of this study was to assess student teachers' motivation in using the e-portfolio and to evaluate the effectiveness of the e-portfolio as a platform for facilitating learning. The research focused on the following areas:

- What are the student teachers' motivations in doing the e-portfolio? We hypothesize that most of the student teachers would be motivated to use the e-portfolio as they would perceive it to be of value in their learning.
- To what extent did the student teachers find the e-portfolio platform effective in terms of user- friendliness, efficiency/error management and user satisfaction? The answer to this question would address concerns on the suitability of the e-portfolio platform, and would determine the nature of any future refinements to be made to the platform, in terms of its design and administration.

3.2. Procedures

The free open source wiki, Google Sites, was chosen as the platform for student teachers to create their e-portfolios. An e-portfolio template was customized specifically to cater for the needs of the student teachers. The participating student teachers were granted access to the platform for the entire duration of their one-year programme, in the course of which they were provided with the relevant support and guidance on the use of the e-portfolio. They were also briefed on how to use the platform to chart their learning and practice of teaching.

3.3. Participants

This study involved the participation of a total of 326 pre-service teachers. These future teachers were enrolled in two different teacher education programmes, leading to the Post Graduate Diploma in Education (PGDE), which offered a year-long training course to university graduates, in preparation for primary school and junior college teaching. Since all PGDE Primary and PGDE junior college student teachers were involved in the e-portfolio initiative, a non-experimental design was used.

3.4. Survey instruments

A 27 item survey was administered to the participating student teachers. Five-point Likert-type scales, ranging from one (Not true at all) to five (Very true) were used for item scoring. The survey focused on student teachers' perceptions of the usability of the e-portfolio platform and their motivation in using the e-portfolio. 13 survey items assessing student motivation were adapted from the Perceived Locus of Causality (PLOC) scale (Goudas, Biddle, & Fox, 1994). The original PLOC subscales for motivation were amotivation, external regulation, introjected regulation, and identified regulation, intrinsic motivation. There were 14 items on e-portfolio platform usability, exploring 3 subscales (user-friendliness, efficiency/error recovery and user-satisfaction).

3.5. Analysis of outcomes and statistical methods

To estimate the reliability of the survey, the Cronbach's alpha was computed to assess the internal consistency of each of the subscales, followed by a principal component analysis with Promax rotation conducted to examine the factor loadings of the various items. Descriptive statistics were computed to obtain the means and standard deviations of each subscale. Correlational analyses using the Pearson product moment correlation were used to assess correlations between subscales.

4. RESULTS

4.1. Reliability

The reliability of the subscales was assessed and the values of the Cronbach's alpha are shown in Table 1. For all subscales, the reliability indices were above the acceptable level of .70, except for Amotivation which had an alpha value of .57, suggesting the need for further refinement in this subscale. Principal Component Analysis was conducted using Promax rotation with Kaiser normalization. The ensuing findings indicate a four factor structure for the subscales on motivation, but with high correlations between identified and intrinsic regulation items, as well as between introjection and external regulation items. The introjected regulation items segregated into two factors, based on whether the behavior regulation was perceived as originating from the self or from an external source, in which case these items loaded with those pertaining to external regulation. Thus, in this study, the scale used consisted of four factors: Autonomous (intrinsic/identified) regulation (5 items), Externally controlled (introjected/external) regulation (4 items), Introjected (2 items) and Amotivated (2 items). A three factor structure was obtained for platform usability, with User-friendliness (7 items), User-satisfaction (3 items) and Efficiency/error recovery (4 items).

4.2. Descriptive Statistics

Table 1 shows the mean scores and standard deviations for the survey subscales. The findings show that the highest mean score was obtained for introjected regulation, followed by autonomous regulation. This suggests that on average, the pre-service teachers felt compelled to do their e-portfolio as it was one of the programme initiatives although a sizeable number of them understood its value and found interest in the endeavour. In terms of platform usability, the highest mean scores were obtained for user-friendliness and user-satisfaction suggesting that the pre-service teachers found Google Sites platform easy to manage.

Table 1. Descriptive statistics and reliability indices for all subscales.

	Mean	Std. Deviation	Cronbach's alpha
Autonomous	2.80	.77	.89
External	2.61	.76	.81
Introjection	2.89	.91	.82
Amotivation	2.56	.82	.57
Userfriendly	3.05	.69	.93
Efficiency	2.83	.74	.88
User satisfaction	2.87	.71	.75

4.3. Correlations

Table 2 shows that there were high, significant correlations between autonomous motivation and efficiency and user-satisfaction; but moderate, and significant correlations between user-friendliness and autonomous regulation. External and introjected regulation showed low correlations with efficiency, user-friendliness and user-satisfaction, while negative correlations were found between amotivation and all three platform usability subscales.

Table 2. Pearson correlations.

	Autonomous	External	Introjection	Amotivation	User-friendly	Efficiency	User-satisfaction
Autonomous	1						
External	.047	1					
Introjection	.357**	.353**	1				
Amotivation	-.336**	.411**	.027	1			
User-friendly	.431**	.046	189**	-.127*	1		
Efficiency	.527**	.071	.197**	-.114*	.817**	1	
User-satisfaction	.535**	.047	.205**	-.167**	.712**	783**	1

**Correlation is significant at the 0.01 level (2-tailed)
*Correlation is significant at the 0.05 level (2-tailed)

5. DISCUSSION & CONCLUSION

The Perceived Locus of Causality (PLOC) scale was adapted to assess behavioural regulations postulated in the Self Determination Theory (Ryan & Conell, 1989). The original scale followed a four factor, ordered correlation structure suggestive of an underlying continuum of increasing self-determination between the four types of behavioural regulations, namely external, introjected, identified and intrinsic motivation. While amotivation describes students who show total disengagement, the level of autonomy increases progressively from external to intrinsic motivation. However, a number of cross-cultural and cross-contextual studies using the PLOC, have produced conflicting views on the factorial invariance of the PLOC. For instance, high correlations were found between the identified and intrinsic regulation (Standage, Duda, & Ntoumanis, 2005; Hagger, Chatzisarantis, & Biddle, 2002) although other teams have shown clear factor structure (Goudas et al., 1994; Ntoumanis, 2005; Wang, Hagger, & Liu, 2009).

In this study, high correlations were also found between identified and intrinsic regulation items, as well as between introjection and external regulation items. Thus the four factors in this current version of the PLOC were renamed Autonomous (intrinsic/identified) regulation, Externally controlled (introjected/ external), Introjected and Amotivated. This demarcation from the original structure of the PLOC can be explained if one considers the collectivistic context of the current study and the application of the instrument in pre-service teacher preparation. Thus, it is quite plausible that participants, who see the value of the e-portfolio in the progression of their career, would ultimately find it an enjoyable endeavor to develop their portfolio, and to design it in their own personal styles, hence the close association between intrinsic and identified regulations.

In general, the pre-service teachers were not particularly enthusiastic over the use of the e-portfolio, although they understood its value. However, on the whole, they seemed satisfied with the Google Sites platform, most agreeing to its user-friendliness. Participants who perceived the platform to be user-friendly and efficient, and were satisfied with it, tended to be autonomous in their motivation towards the use of the e-portfolio. On the other hand, those who were generally dissatisfied with the platform, tended to be either externally motivated or lacked motivation towards the e-portfolio altogether. This indicates that platform usability is likely to influence motivation in e-portfolio usage, and future research could focus on a qualitative approach to explore in finer detail the aspects of platform usability that could be further refined in order to promote more autonomous motivation

towards e-portfolio usage. The negative correlation between amotivation and platform usability could be attributed to the participants' level of competence in using computer technology, with the less IT-savvy users having difficulty in managing the e-portfolio tool and thus being demotivated in using it.

Although as predicted, the student teachers perceived the e-portfolio to be of value in their learning, they did not show the high level of motivation that was expected in terms of its usage. The findings indicate that they were mostly doing their e-portfolio in compliance with course requirements or because they understood that it was of some importance to them. The generally positive views on Google Sites indicate that the platform is suitable for future implementation of the e-portfolio at institutional level.

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