

# Does technology matter? Students' and teachers' experiences of electronic portfolio (e-portfolio) systems in teacher education

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Electronic portfolio (e-portfolio) systems have the potential to change learning outcomes where student learning is achieved through the process and the final product. However, previous research has identified problems with the technical features of some e-portfolio platforms (Deneen & Brown, 2013), and with the rigidity and complexity of user interface (Shroff, Deneen, & Ng, 2011) that may subvert intended learning goals. These e-portfolios were evaluated since they serve to document the achievement of the Graduating Teacher Standards and to assist in job hunting. A combination of interviews and self-reports on the User Information Satisfaction (UIS) instrument were utilised, along with the Usability Evaluation Method (UEM) to evaluate the usability and learning design of the various technology platforms. An exploration of technology and user characteristics will be factored in to discern the quality of student portfolios and e-portfolio systems maturation.

Keywords: e-portfolios, technology platform evaluation, higher education, teacher education

## Electronic portfolio (e-portfolio) systems

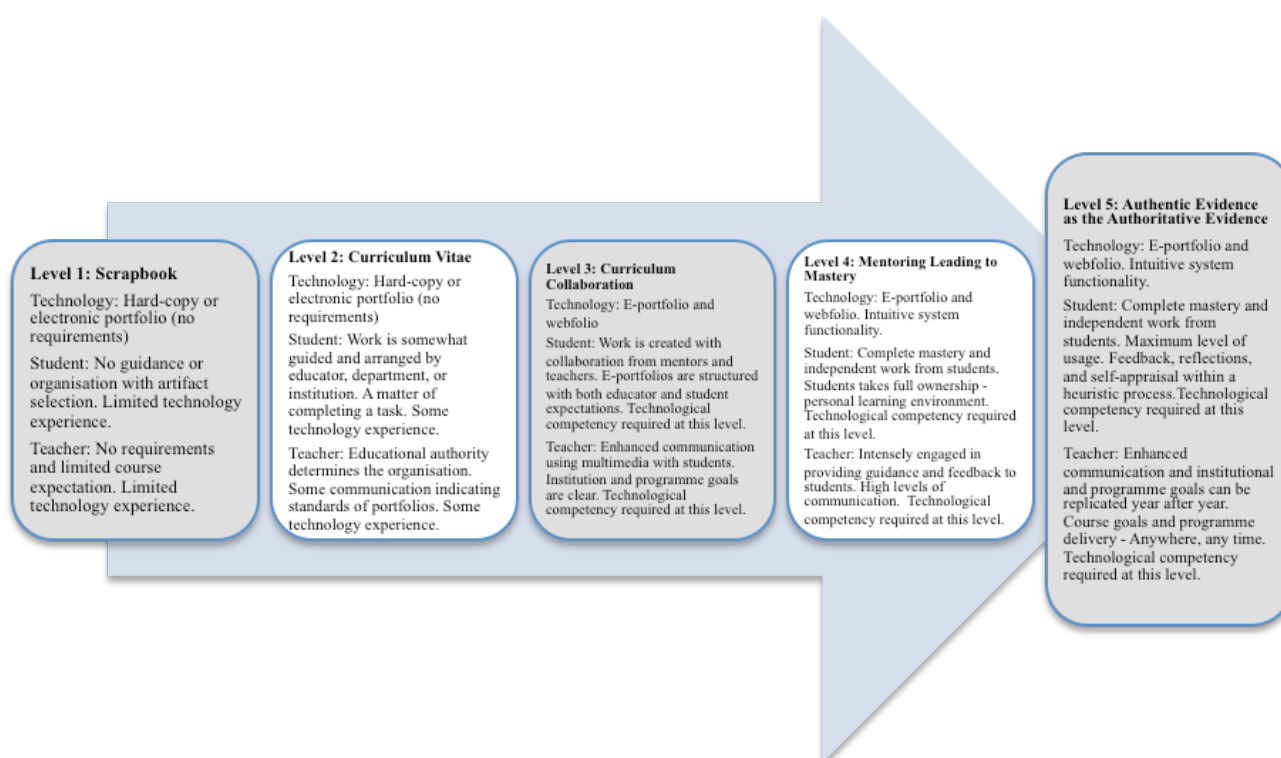
In recent years, electronic portfolio (e-portfolio) systems have been adopted in schools for the purpose of improving learning outcomes and fostering heuristic learning. Additionally, e-portfolio systems can be utilised to demonstrate and showcase achievements for career enhancement, professional development and as part of academic audits and reviews (Allan & Cleland, 2012). However, despite studies showing supposed formative and summative benefits around e-portfolio development (Chau, 2007; Struyven, Blicek, & DeRoeck, 2011), research has identified problems with technological features of some e-portfolio platforms (Deneen & Brown, 2013) and in terms of level of robustness and ease of control based on managing the flow of information and interface (Shroff, Deneen, & Ng, 2011). Issues with implementation of e-portfolio systems and students' low adoption rate of the system have also been well documented (Lambert & Corrin, 2007; Shroff, Deneen, & Ng, 2011).

Within this context, the deployment of educational technologies to solve educational problems is not straightforward. Previous research has found that it is important for any educational technology (a) to be easy to use, (b) to produce a beneficial user experience, and (c) to not distract or prevent users from achieving intended purposes (Hattie, Brown, Ward, Irving, & Keegan, 2006). In essence, technology has to become invisible to users so that the attention is on achieving the intended learning purpose of the software and not the technology system (Hattie, et al., 2006). While there are many causes of e-portfolio failure (Chau, 2007; Shroff, Deneen, & Ng, 2011; Deneen & Brown, 2013), one under-examined aspect is the role of the technology itself. According to Laxman (2010), technology must reflect real world applications to enable meaningful learning from users. Otherwise, the intended goals of improved learning and teaching may be subverted by the interaction of human abilities and attitudes with technological characteristics.

The purpose of this study is to evaluate the technology platforms adopted for e-portfolios, user characteristics and users experience with the system. The research questions the study will delve into are: (1) does the technology platform adopted for e-portfolios impact students' experience? (2) Do student characteristics (technological abilities and attitudes and ecoshock levels) affect the quality of the portfolios students create? (3) Does the technology characteristics of e-portfolios impact the quality of teacher experience with the system and does teacher experience influence student experience with the system? (4) Lastly, do the technology, teacher, or student characteristics affect the quality of e-portfolios students create? And, do these characteristics impact e-portfolio maturation?

## Stages of e-portfolio maturation

The e-portfolio maturation framework is helpful in determining where e-portfolio usages are at in terms of technological characteristics, user characteristics, usage and institutional goals.



**Figure 1: Stages of E-Portfolio Maturation (Love, McKean, & Gathercoal, 2004)**

### *Level 1: Scrapbook*

At this initial stage, students' e-portfolio usage does not reflect course and programme learning objectives. Students collect some of their course work and achievements but reflections are unguided. Students' work may be arranged in chronological order but viewers can only guess at the meaning of each item (Love, McKean, & Gathercoal, 2004).

### *Level 2: Curriculum Vitae*

At level 2, the collection of students' work is guided and driven by an educator, department or institution (Balaban, & Bubas, 2010). E-portfolios are organised and structured with a purpose. However, there is very little consistency in the student-generated content and students do not fully assess the importance of the e-portfolio. The educational authority determines the organisation and purpose, and students merely conform.

### *Level 3: Curriculum collaboration between student and faculty*

Students understand the purpose and value of the system. Collaboration is visible through enhanced level of communication and reflections between student and teacher. Communication and presentation consist of papers, photographs, videos, and appropriate feedback among students, teachers, mentors, and possible recruiters/employers (Love, McKean, & Gathercoal, 2004).

### *Level 4: Mentoring leading to mastery*

Love, McKean, and Gathercoal (2004) stressed that at this level of e-portfolio maturity it is more than just "meeting minimum standards" or to "please the professor" (p. 30). E-portfolio technology platforms are intuitive with complete training and technical support for learners and educators. Students have gained ownership of their e-portfolio system and view it as their own personal learning environment.

### *Level 5: Authentic evidence as authoritative evidence for assessment, evaluation and reporting*

E-portfolio usage is organised by curricular requirements and standards established by a nucleus of effort from

educators, programme leaders, and the institution (Love, McKean, & Gathercoal, 2004). Students' use is at the maximum level. Educators and the institution perform formative and summative assessments through the e-portfolio system and programme goals are highly visible and easily linked.

### **Case study: evaluating e-portfolio systems at the University of Auckland teacher education programme**

E-portfolio maturation takes time, for institutions and educators must systematically work together through the five stages of development (Love, McKean, & Gathercoal, 2004). At the University of Auckland teacher education programme, the MyPortfolio system (an e-portfolio platform created by Mahara) and Google Sites were implemented to serve and document achievements to attest to the Graduating Teacher Standards and assist students in preparing portfolios of their learning as prospective teachers. The study will evaluate the e-portfolio technology platforms adopted by the Early Childhood Education (ECE) and Graduate Diploma in Teaching (Secondary) using psychometric scales measuring user satisfaction and the usability and learning design of e-portfolios. Moreover, the maturation level of the current e-portfolio use will be estimated during this phase.

To achieve this, the initial step of the study involves two components. Component 1 will obtain students' experiential feedback of the technology platforms being utilised in teacher education programmes. A combination of interviews and self-reports on the User Information Satisfaction (UIS) instrument (Ives, Olson, & Baroudi, 1983) will be used.

Component 2 will evaluate the technical aspects of the e-portfolio technology platforms MyPortfolio (Mahara) and Google Sites. Additionally, the study will also evaluate WordPress, Blogger, Tumblr, and LiveBinders systems to develop a more comprehensive rating of e-portfolio technology platforms. Zaharias and Poylymenakou's (2009) Usability Evaluation Method (UEM) will be used to evaluate the usability and learning design of the various technology platforms.

Initial findings will be available when the paper is presented at the ascilite 2014 conference. The study will have an initial user satisfaction, usability, and learning-rating sample of technology platforms of the e-portfolios adopted at the University of Auckland teacher education programme. Student experiential feedback and primary findings will be based on the following items:

- User satisfaction and experiential feedback;
- User rating of e-portfolio technology platform interface;
- Students' user evaluation of MyPortfolio (Mahara) and Google Sites in meeting course and programme objectives; and
- Usability and learning design rating of e-portfolio technology platforms.

### **Going forward: e-portfolio technology platforms, user characteristics and maturation**

Future directions of the study will examine user characteristics and challenges that may impact user experience and quality of work in e-portfolios. The study will factor in user characteristics, which are students', and teacher's technological abilities and attitudes, and ecoshock levels to determine if these user characteristics are affecting the quality of work in e-portfolios. Ecoshock is defined as the stress, anxiety, fatigue and difficulties people experience when faced with a new environment or ecology (Fontaine, 2000; San Jose & Kelleher, 2009). Users may experience ecoshock when faced with new learning educational technologies. Ecoshock helps us appreciate the novice's experience in how difficult a technology is. The challenge here is that students are to create their work using the system and if they are experiencing ecoshock they may produce less than favourable learning outcomes. Previous studies have shown that students who experienced ecoshock tend to withdraw and not participate in online learning environments (San Jose & Kelleher, 2009; Redmond, Devine, and Basson, 2014). Likewise, teachers are supposed to support their students, even though they themselves may be shocked by the technology.

The exploration of the links between technology characteristics of e-portfolios and student and teacher characteristics will ultimately pave the way for future research in identifying factors needed to progress e-portfolio usage in the highest maturation level. The key consequence of the study is not just an evaluation of technology platforms and a greater understanding of user technological abilities and perceptions, but an exploration of strategies toward educational technology maturation for enhanced teaching and learning.

## Acknowledgements

I gratefully acknowledge A.P. Gavin T. L. Brown for his maintained guidance, supervision and mentorship. Special thanks go to A.P. Kumar Laxman for his technological savvy and new perspectives. To Hope always.

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**Please cite as:** San Jose, D. L. (2014). Does technology matter? Students' and teacher's experiences of electronic portfolio (e-portfolio) systems in teacher education. In B. Hegarty, J. McDonald, & S.-K. Loke (Eds.), *Rhetoric and Reality: Critical perspectives on educational technology. Proceedings ascilite Dunedin 2014* (pp. 584-588). <https://doi.org/10.14742/apubs.2014.1290>

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