

# **Implementing e-portfolios in secondary schools: The lessons to be learned from higher education.**

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## **Abstract**

*Universities and colleges around the world are embracing the use of electronic portfolios (e-portfolios) as one of the more important elements of their e-learning strategies. Schools and colleges have a similar pedagogic need for e-portfolio technology. This paper explores the use of e-portfolios in higher education and identifies the strategies, processes and functionality that have implications for teachers in schools. It proposes a research approach to better understand the affordances of e-portfolios across 11-18 education.*

A significant number of higher and further education institutions have embraced the available digital technologies in a strategic approach to enhance the educational experience through delivering more flexible and cost effective courses to their students (Segrave and Holt, 2003). Universities and colleges around the world are embracing the use of electronic portfolios (e-portfolios) as one of the more important elements of their e-learning strategies.

As universities strive to educate for excellence in professional practices, the emphasis is shifting to student-centred learning. This has fuelled the use of e-portfolios as multipurpose repositories where students store evidence to be used later to assess their pedagogical progress. It also becomes an area where they can showcase their

best work, structure their personal development plans (PDPs) and used to reflect on their progress and their learning (Ward and Moser, 2008).

The changes and challenges experienced by universities may provide valuable information to primary and secondary practitioners wishing to implement similar e-learning strategies in their own teaching environments. These practitioners are often well motivated to embrace new and innovative educational methodology and design philosophies but often denied access to time, expertise and funding to conduct much needed research.

## **Theoretical Perspectives**

Existing theoretical models are used to ground the concepts that promote the acceptance and utilisation of e-portfolios amongst university students (Terheggen et al., 2000).

These include:

Tinto's model of attrition or student integration suggests that the level of social and academic interaction of a student with the institution is detrimental to their persistence to complete a course. The use of e-portfolios promotes and accelerates student integration through interaction with other students on campus (Braxton et al., 2000).

Astin's theory of involvement refers to the physical and psychological energy that students invest in their studies. He postulates, amongst others, that students' learning is directly proportional to their involvement in the program and their interaction with other faculty members. Through structuring and developing e-portfolios, students become active participants in shaping their own learning (Astin, 1999).

Roger's theory of the Innovation-Diffusion Model emphasises the process by which new technologies are accepted or rejected over time. Successful diffusion of new technologies often requires reforming and restructuring of institutions in five distinct stages: Knowledge, Persuasion, Decision, Implementation and Confirmation (Lee, 2004).

Globally, academic institutions are studying the impact and populating innovative applications of e-portfolios (Cohn and Hibbitts, 2004). Some faculties and institutions rely on e-portfolios to provide accreditation agencies with tangible evidence and supporting artefacts of achievement of the expected outcomes. This regularly results in the creation of dynamic e-portfolios that remains functional for the duration of courses but then becomes obsolete on graduation.

The use of e-portfolios should therefore be used encourage and motivate pupils to develop and collect content that can contribute to a Lifetime Personal Web Space (LPWS) by shifting the focus of the learning process from a teacher-centred to a learner centred environment in a meaningful way (Terheggen et al., 2000). An understanding of the theoretical concepts in grounding practical application could assist teachers and pupils in reaching e-maturity (Underwood et al., 2010).

## e-Portfolio Rationale

### The two faces of e-Portfolios

e-Portfolios are characterised by the combination of two modes of use: the process portfolio, which is a collection of a series of activities, and the product portfolio, which is compiled at the end of a course or learning experience.

Process portfolios become workspaces for documenting learning through collaboration and personal reflection. Formative assessment for learning scaffolds the learning process and directs the student to collect appropriate evidence that tells a rich picture of their achievements and mastery of skills. Feedback is provided immediately to guide the learner to improve their learning and learning strategies. It is usually chronologically organised and intended for an internal audience.

Product portfolios or showcase portfolios are used to display the best efforts of a student and provides evidence for summative assessment at the end of a learning experience to report on the student's achievement of goals, standards and outcomes. These types of portfolios are intended for an external audience (Abrami and Barrett, 2005, Barrett, 2007a, Stefani et al., 2007, Tosh and Werdmuller, 2004) and are usually organised in a thematic way.

The product portfolio is often associated with assessment or job seeking while the process portfolio is associated with reflection, deep learning, knowledge growth and social interaction. Some tension exists between the two types of portfolios (Barrett, 2010). The conflict is especially detrimental when one seeks to use the portfolio for learning purposes, yet tells portfolio authors that their portfolios will also be used for high-stakes assessment or as a device for obtaining a job (Ward and Moser, 2008).

"The constructivist approach puts a premium on the selection of items that reflects learning from the student's perspective." (Paulson and Paulson, 1994, p.8)

Using the Constructivism approach to assess portfolios creates further tension between these two modes. Paulson and Paulson (1994, p.7) refer to portfolios as being either positivist or constructivist. The positivist portfolio assesses learning outcomes that have been defined externally while the constructivist portfolio becomes an opportunity for the learner to construct their own meaning (internally).

### Assessment

Students can, with difficulty, escape from the effects of poor teaching, they cannot escape the effects of poor assessment (Boud, 1995).

One of the main purposes for the use of e-portfolios is for assessment. It, therefore, becomes an appropriate starting point to reflect on some of the challenges of teaching, learning and assessment practices in higher education.

The tension between the two approaches can be alleviated if institutions take a fresher look at assessment. The final objective of assessment is accreditation. While the two faces of e-portfolios provide valuable information for assessment, the process fails to evaluate what was set out to be done, what has been accomplished, how this was accomplished it and whether time and resources were managed and used effectively.

Deep learning and surface learning are two concepts that seem to pervade in all literature describing practices in higher education. Winter (2003) argues that the

mere concept implies that 'the whole educational enterprise is frequently ineffective at the most basic level'.

Deep learning is associated with understanding of ideas, seeking meaning, making connections and finding innovative applications of knowledge and skill (Prosser and Trigwell, 1999).

Deep learning is associated with a four-stage process:

- unconscious incompetence – being unaware of the fact that we do not know something;
- conscious incompetence – becoming aware of the fact that we do not know something;
- conscious competence - learning to do something;
- unconscious competence – doing something naturally without thinking about it.

Education practices evolve from formal pedagogy to heutagogy where action-learning recognises reflection and, therefore, the prospect of double loop learning (through regular feedback) in processes designed to facilitate learning.

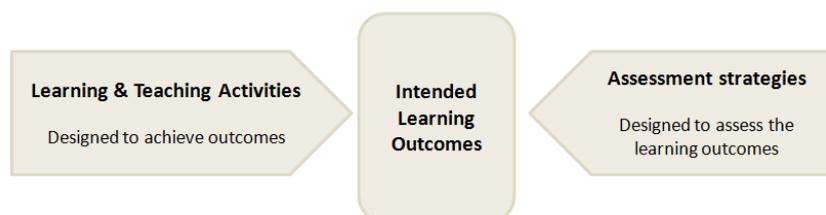
Surface learning, on the other hand, is often nothing more than short term memorising that motivates students to 'play the system'. Students comply only with the assessment criteria and expected course outcomes.

Learning activities are made up of a collection of smaller tasks that collectively contribute to the whole. This ensures that the effort of the student is evenly distributed over a period of time and spread across different types of learning activities. The student has sufficient time to 'digest' and reflect on the content and the learning process.

All of these are key aspects of the Patchwork text process. This innovative coursework format as proposed by Scoggins and Winter (1999) forms a synergy between the critical dimension of education (Barnet, as cited by Scoggins and Winter, 1999) and assessment strategies that recognise learners' deeper understanding.

The patchwork approach has been adapted by Arnold et al (2009) to explore the creation of patches and the development of online communities. Patchwork media uses a range of rich digital applications to collect, structure, organise and stitching together of patches of work.

The principle of constructive alignment (Biggs, 1996) as illustrated in Figure 1 is used to design learning activities that will lead to the achievement of the intended learning outcomes (Arnold et al., 2009). One learning activity will enable the learner to achieve a single outcome to produce one patch.



**Figure 1.** Constructive alignment.

Constructive alignment facilitates deep learning where the student takes some responsibility for their own learning. This builds trust between the student and the teacher through clarity of design and transparency between learning and assessment.

It does, however, require careful planning that is often time consuming. It is not an easy task to achieve and practitioners need to be reflective and experienced to achieve success. It requires frequent modification of the module descriptive, making it unsuitable for rigid programs.

As accreditation becomes more transparent, a clear evaluation process should be implemented to balance the two faces of e-portfolios. Multi-faceted e-portfolio systems should be used when conflict paradigms exist. The ideal system would provide a platform for simultaneously creating institution-centred assessment and accountability systems without hampering the individual when building and organising a personal lifelong learning space (Barrett, 2007b). Formative and summative assessment becomes authentic through ipsative assessment.

### Format of e-portfolios

e-Portfolios have moved beyond the stage where it exists as a single document created in a word processing or slideshow software. With the development of Web 2.0 tools, e-portfolios have become a network application where the author organises the content and controls all administrative functions including who can view, discuss or comment on the content (access) (Greenberg, 2004).

The e-portfolio landscape could begin on a small scale but should offer scope for expansion and flexibility to allow for the developmental capacity of the user. It takes on a beehive-configuration illustrated in Figure 2. This structure closely resembles our neural system rather than the more familiar and traditional 'filing cabinet' system (Cohn and Hibbitts, 2004).



**Figure 2.** The Beehive configuration

As previously mentioned, this approach extends to accommodate social constructivism by encouraging students to develop online communities where they

share their patches with their peers and develop new understanding (and learning) through formative feedback ('peer review').

One aspect of patchwork writing is that it is continuously developing and never finished in a similar way that it was originally started. The socially constructed understanding is an organic process and never ends, as each person contributes their personal understanding to the collective.

This approach enables us to assess student ability rather than knowledge and reminds practitioners to focus on the process rather than product.

## Functionalities

It is necessary to reflect on some of the existing challenges and recent developments for anticipating such implications and suggest possible ways of overcoming these.

It is reported that some students in higher education reverted back to paper based portfolios because of incompatible software platforms (Currant et al., 2006). Poor interoperability prevents the effective transfer of data, information and evidence of achievement from one institution to the next.

Interoperability also affects the ability of students to access their e-portfolios from any location or the ability to take it from one place to another – also known as portability. Tolley (2008) differentiates between 'horizontal portability', which allows learners to take their content from one institution to another or sharing the portfolio across two or more different institutions or across two or more subjects in the same institution. 'Vertical portability' enables students to move content from primary to secondary to higher education and so on.

JISC has developed a set of technical definitions (the thin e-portfolio Reference Model) also known as Leap2A. These services make use of an e-Portfolio 'engine' to interact with other e-Portfolio enabled services and e-Portfolio enabled repositories. Systems that have implemented Leap2A are ePet, Mahar, MyProgressFile and PebblePad (Smart, 2010).

The development of Web 2.0 services and Cloud Computing has seen an increase in the demand for more flexible functionality or *thin model*, in favour of a more rigid, *fat model* application, consisting of pre-defined templates and formats (Curyer et al., 2007).

The conceptual model proposed by Helen Barrett (Barrett, 2007) that uses a variety of Google tools to create e-portfolios is illustrated in Figure 3.

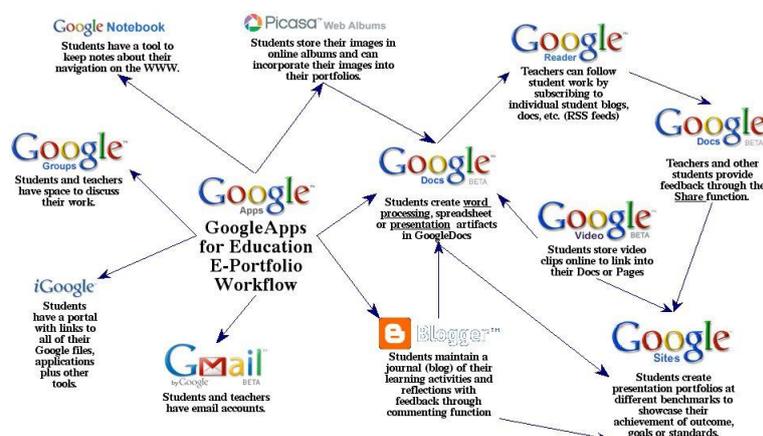


Figure 3. The Google model

## Other implications

### Personal Web Spaces

The use of e-portfolios should form part of a much larger contemporary learning environment which embraces both the virtual and the physical learning environment to promote learning and communication. By integrating the academic and administrative support, students learn to construct and develop individual digital spaces that accommodate their developmental achievements and needs across an entire lifetime (Cohn and Hibbitts, 2004; Segrave and Holt, 2003).

Lifetime Personal Web Spaces (LPWS) will guarantee continuity from one educational key stage to another with little loss of content. As different platforms are becoming compatible, transition from one institution to the next will happen almost effortlessly.

### Community Building

Traditionally, education was considered an informal social activity that happened within small communities (Bessenyei, 2008). By formalising education and creating specialised institutions, we have, to a large extent, isolated students and practitioners from others doing the same thing elsewhere. ICT applications offer a new opportunity to reintegrate the learning content, communities of learning and communities of practice through collaboration and communication (Botterill, 2011; Lewis and Allan, 2005).

The birth of 2.0 technologies started an information renaissance unprecedented in the history of man. Students are able not only to use the network to search for existing information but also connect with others and contribute to the global body of knowledge using for example Wikis (Bessenyei, 2008).

Connectivism, an emerging learning theory of the information age (Siemens, 2004) considers the role of information exchange, organised into networks, in promoting better learning for digital natives. Learning communities, structured through organised networks, become the curriculum and the classroom (Cooper, 1993).

Traditional learning theories associated with instructional design methodologies focus mainly on individual learning, either externally on events and reinforcement (behaviourism) or internally on mental activities (Cognitivism and Constructivism) (Cooper, 1993). Connectivism, like social constructivism, takes into account how learning becomes more significant through informal information exchange (Bessenyei, 2008; Siemens, 2004).

### Stakeholders

The term 'Stakeholders' refers either to an audience or an individual participant. Members of the audience will have an interest in and be addressed by the project whereas the participants play an active role in guiding and shaping the content (Paulson and Paulson, 1994). In some instances audience members may become participants and vice versa. It is crucial that the developer of an e-portfolio clearly identifies all the members of the involved stakeholder-community.

### Inclusive learning

Traditional 'one size fits all' education models were never designed to provide individual students with the best possible opportunities to achieve their desired learning outcomes in a way they feel comfortable and secure. It has become

increasingly important and sensible to use all available technologies to develop an education framework where diversity of perspectives is highly valued and assessment strategies benefit all types of learning styles.

It would be wrong to assume that students who uses technologies (digital natives) have had equal access to all of the available technologies or that they have developed appropriate skills required to support learning (Stefani et al., 2007).

## **Security**

Access to applications, networks (VPN), e-mail and internet resources are more restricted in schools and colleges than on university campuses. To comply with health and safety and child protection issues, security features such as caching, proxy servers and firewalls are put in place to prevent unsupervised access to potentially harmful resources (Carrant et al., 2006).

Remembering different access codes, passwords and user names for different accounts and applications becomes daunting as the application-net expands. Centralised management systems improve connectivity and provide a convenient 'one stop shop' (Cohn and Hibbitts, 2004).

## **Training and support**

The knowledge domain of most teachers can be categorised as (A) Subject Matter Knowledge (SMK), (B) Pedagogical Content Knowledge (PCK) and (C) Attitude (Rohaani et al., 2008).

Suitable training programs should be made available for teachers (and pupils) to extend their knowledge domain to include e-learning strategies in general, but more specifically the use of tools to develop e-portfolios. The successful introduction of e-portfolio systems in a single course, subject, department or whole school relies on the positive attitude of the teachers and the pupils. Healthy attitudes can develop through clarity of purpose and by involving users in the planning and piloting stage of the project – which in turn leads to early adoption and taking ownership.

## **Conclusion**

The preference of 'digital natives' to use available technological workspaces and platforms for generating content are presently inspiring the adaption of exciting assessment and accreditation strategies used in further and higher education. The literature suggests it is the multiple purposes of e-portfolios that make them valuable and authentic assessment tools.

The challenges and rewards experienced in further and higher education should be utilised to inform and facilitate the transition from paper-based portfolios to e-portfolios in primary and secondary schools. Educators, technologist and managers should use this knowledge and skills to avoid the possible potholes when (and not 'if') implementing e-portfolios to enhance learning and teaching.

As far back as 2005, the Department for Education and Skills formulated policy to encourage institutions to provide a personalised online learning space for every learner in full-time education. In 2011, however, this has still not materialised (DfES, 2005, p.5).

The ultimate aim is for each young person to have access to a dedicated lifelong web space which opens up opportunities for them to collect and connect a lifetime of

developmental capacities of their personal, educational, social and business constructs from a very early age.

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